MUNICIPAL INFRASTRUCTURE AND IDP HOUSING REHABILITATION PROJECT

CONCEPT STUDY – A PROPOSED USAID FUNDED NEW IDP HOUSING SUBPROJECT

CONTRACT: AID-EDH-I-00-08-00027-00, TASK ORDER: AID-114-TO-11-00002

22 MAY 2012

This document was produced for review by the United States Agency for International Development. It was prepared by Tetra Tech for the Municipal Infrastructure and IDP Housing Rehabilitation Project, Task Order number AID-114-TO-11-00002 under the USAID Architectural and Engineering (A&E IQC).

TETRA TECH

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TETRA TECH

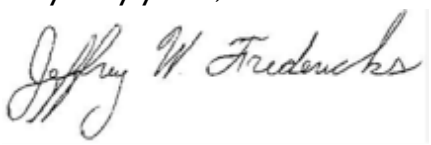
22 MAY 2012

Mr. Bradley Carr
COR
Office of Economic Growth
US Agency for International Development
11 George Balanchine Street
Tbilisi, 0131
Georgia

Re: Concept Study – A Proposed USAID Funded New IDP Housing Subproject (Draft)
For the Municipal Infrastructure and IDP Housing Rehabilitation Project

Dear Mr. Carr:
This report is being submitted to you in accordance with the requirements of task order no. AID-114-TO-11-00002 of contract AID-EDH-I-00-08-00027-00. It provides Tetra Tech's Concept Study – A Proposed USAID Funded New IDP Housing Subproject for the Municipal Infrastructure and IDP Housing Rehabilitation Project.

Very truly yours,



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CC: USAID (George Kokochashvili); MDF (Kartlos Gviniashvili); Tetra Tech (Firouz Rooyani, Dean White, Tom Chicca, Ilia Eloshvili)

Contents

Acronyms

ADA	Americans with Disabilities Act
CC	Collective Center(s)
CM	cubic meter(s)
COP	Chief Of Party
COTR	Contracting Officer's Technical Representative
DHS	Durable Housing Solution
EA	Environmental Assessment
EIA	Environmental Impact Assessment
ESS	Environmental Scoping Statement
GEL	Georgian Lari
GMIP	Georgia Municipal Infrastructure and IDP Housing Rehabilitation Project (the project)
GoG	Government of Georgia
ha	hectare(s)
HO	Home Office
HVAC	Heating, Ventilation & Air Conditioning
IBC	International Building Code
IDP	Internally Displaced Persons
IL	Implementing Letters
km	kilometer(s)
M	linear meter(s)
MDF	Municipal Development Fund
MEP	Mechanical, Electrical and Plumbing
MRA	Ministry of Refugee Affairs
PE	licensed Professional Engineer (USA designation)
PEA	Programmatic Environmental Assessment
PM	Project Manager
PWD	Persons With Disabilities
SOW	Scope of Work
SQM	square meter(s)
STTA	Short Term Technical Assistance
TBD	To Be Determined
Tt	Tetra Tech
UPA	Urban and Peri-urban Agriculture
USAID	United States Agency for International Development
USD	United States Dollar
USG	US Government
WWTP	Wastewater Treatment Plant

A Summary of Findings and Recommendations

This Concept Study was undertaken to provide USAID and the MRA with information that can be used to make siting, procurement, and other project management decisions concerning a proposed USAID funded IDP Housing project. The project consists of new apartment blocks and has a target all-in cost of approximately $5 Million (8.25 Million GEL). The main findings of this study are as follows:

1. A project totaling five apartment blocks that includes the basic requirements for off- and on-site utilities and amenities similar to those previously constructed in Batumi, Poti, and Zugdidi by MDF fits the cost estimate.
2. There is a lack of useful IDP employment and demographic data that would have contributed to the siting assessment in this study. One clear finding from this study is that IDP unemployment runs in the 90% range.
3. Three sites were investigated during the course of this study in Batumi, Poti, and Kutaisi.
    a. The Batumi site is unsuitable for development at this time and it is recommended that the site be dropped from consideration.
    b. The Poti site also seems less than ideal for development and it is recommended that Poti not be considered for development. The review team is concerned by the potential environmental and social impacts associated with expansion of the already densly populated IDP housing on this site.
    c. The Kutaisi site is the best alternative. The site still requires environmental review for contamination from adjacent (abandoned) industrial uses and a review of available utilities. As a benefit of using this site there are collapsing collective centers in Kutaisi and the project would provide a more integrated approach to housing for the IDP residents without clustering large populations within one area or displacement from existing social and economic networks. Tt also has a regional office in Kutaisi.
4. A preliminary schedule for a proposed project in Kutaisi would include eight months of procurement; design; development of drawings and specifications; and environmental work as well as 12 to 14 months of construction for a total of approximately 22 months.
5. A proposed five block complex will require 1.8 to 2.0 ha of development.
6. The proposed building designs for the four story Poti style "Block B" is not IBC compliant, and needs modifications to the drawings and specifications need to be produced.
7. Observations of the existing IDP Housing in Batumi and Poti were made to identify any potential deficiencies in the design. The following deficiencies were observed:
    a. Serious issues with site, exterior building and interior building construction quality
    b. Existing IDP housing first floors are not USAID PWD Policy compliant.

Preliminary all-in cost estimates for this proposed project sited in Kutaisi are:

a.	Off- and On-Site Development	975,925 GEL ($ 591,470)
b.	Five Apt. Buildings	6,395,001 GEL ($3,875,758)
c.	Contingencies @3%	221,128 GEL ($ 134,017)
d.	Total	7,592, 054 GEL ($4,601.245)
e.	Cost/SQM	1,379 GEL ($836)
f.	Cost/Apartment	47,450 GEL ($28,758)

8. Small farm holdings on land adjacent to the IDP housing blocks could offer IDPs income generating opportunities and the ability to self-grow fresh food.

The main recommendations of this study are as follows:

1. This Study recommends Kutaisi #1 site the best site and development alternative for this proposed project. The Kutaisi site needs environmental clearance, due to a neighboring tractor plant, to ensure that the soils and ground water are not contaminated beyond a reasonable level. Prior to making final financial arrangements for any project in Kutaisi, a preliminary design of utility services should be conducted to ensure that proper capacity exists and to improve the off- and on-site utility cost estimates.
2. It is recommended that a new building design be produced that includes the following:
    a. Performing this Subproject as a *Design – Bid – Build* Subproject;
    b. MDF procuring the services of a qualified A/E firm that has experience with IBC requirements for design;
    c. A utility survey be conducted to determine if adequate water, gas, electric and wastewater connections are available;
    d. Tt performing water and soil testing on the Kutaisi site and producing a ESS and EA for the site;
    e. The MDF engaged A/E producing the new building design, drawings and specifications and Tt Home Office reviewing and approving outputs;
    f. New building drawings and specifications containing provisions for site grading, drainage and all on-site utilities including fire protection measures;
    g. New building drawings and specifications allowing for handicap ramps and service on the ground floor in accordance with USAID PWD policy and ADA guidelines.
3. During construction, MDF needs to provide capable On-Site Inspection and overall professional quality control to ensure acceptable and cost effective finished construction.
4. It is recommended that USAID fund a STTA consultant to design a self-help community-based UPA program in association with this building project. Further, that this consultant return and assist IDPs in starting the project to promote its sustainability.

B Introduction

1 GMIP Project Description

The United States Agency for International Development (USAID)/Caucasus Office of Economic Growth under is implementing the Municipal Infrastructure and IDP Housing Rehabilitation Project through the GoG's Municipal Development Fund (MDF) to upgrade municipal infrastructure in targeted municipalities, rehabilitate irrigation channels, and improve housing for Internally Displaced Persons (IDPs).

The dual shocks of Georgia's August 2008 conflict and the global economic downturn pose serious challenges to Georgia's economic stability. The conflict, crisis, and subsequent slowdown in economic growth and foreign direct investment have placed a severe strain on Georgia's national budget and its ability to finance core investments in critical regional development initiatives. Many years of decline in the quality, coverage and maintenance of basic services, including water supply, sewage, local roads, solid waste services, and irrigation systems have dramatically reduced Georgia's quality of life in rural areas and constrained private sector growth. Such degradation and instances of conflict-related damage have resulted in significant constraints to the productive capacity and quality of life of thousands of Georgians, including old and new IDPs, rural poor, and persons directly or indirectly affected by the 2008 conflict.

The project includes three major components and two subcomponents:

1. Component 1: Municipal Infrastructure
2. Component 2: Rehabilitation Of Irrigation Infrastructure
3. Component 3: IDP Durable Housing
   a. Subcomponent 1: Provide Water And Sanitation Upgrades For IDP Cottage Housing For IDPS From The August 2008 Conflict
   b. Subcomponent 2: Provide Durable Housing Solutions For IDP From 1990s Conflict. IDP Housing

Component 3: IDP Durable Housing will provide IDPs with durable housing including 'cottages' and collective settlements. The budget amount is USD 34.67 million; is designed to rehabilitate up to 2,600 apartments and 4,000 cottage units focusing on the municipalities of Rustavi, Kareli, Khashuri, Kutaisi and Zugdidi.

Implementation Letters have been signed between MDF and USAID. MDF will be responsible for all development and rehabilitation works for the project including the design and planning of infrastructure improvements; implementing environmental mitigation practices; tendering, awarding, and managing rehabilitation-related activities outsourced to a contractor; and closing-out all rehabilitation activities.

2 Background

For the purpose of this study a summary of the housing situation for Georgia's internally displaced persons (IDPs) is included in **Appendix 2**. This section was provided by MRA

and is titled *Brief Overview of Achieved Results Regarding IDP Housing*. Appendix 2summarizes the numbers of IDPs, IDP families and their current housing situation by location and by type of housing. Each of the different methods used to providing housing to IDPs has its own strengths and weaknesses and discussing these are beyond the scope of this study.

When planning a non IDP residential housing development in the private sector, developer and municipal commissioned market studies identify future apartment user preferences and market needs. This helps the developer and the municipality make sure any new apartment buildings and supporting infrastructure are as cost effective as possible. For this study, having more reliable sophisticated IDP characteristic data would be beneficial in completing a site selection analysis. To this end, some of the anecdotal IDP preferences are included in the next section on Site Selection.

One other factor that was discussed during the information gathering phase of this study was the phenomena of "collapsing collective centers." These housing facilities are non-renovated buildings in poor condition in which IDPs now live and from which they need to be transferred. There has been discussion about siting the project under study in an area where there is a higher number of IDPs living in these facilities.

3 Purpose of the Concept Study

The purpose of this concept study is to provide USAID / Georgia, the GoG MRA, the MDF, and Tetra Tech GMIP with preliminary site selection; apartment building, cost, and construction schedule; and information for a proposed new GMIP subproject that includes the design and construction of new IDP housing units. The study also includes recommendations on next steps if a decision is made to move forward.

Other objectives of the study are as follows:

1. Fit the proposed project to a budget of approximately $5 Million;
2. Determine if the existing IDP Housing Design is International Building Code (IBC) compliant and depending on findings suggest alternatives to the proposed new building design; and
3. Propose a preliminary urban and peri–urban agriculture (UPA) adjunct activity that offers IDPs in these new apartments minor employment opportunity and access to fresh foods.

4 Methodology

The basic components of this concept study are as follows:

1. A review and investigation of the proposed sites for the project (desk review and field visit); and
2. A review of existing new building designs, drawings, specifications and other data to determine their technical acceptability for use on a USAID-funded project.

The review and investigation of the sites was accomplished by:

1. Reviewing design data supplied to Tt by MDF for an existing IDP building project Poti that was constructed in 2011.
2. Paring down the possible Municipalities for consideration prior to undertaking the trip into the field. Early discussions included Zugdidi, Tskaltubo, and Khoni Municipalities as potential sites, but discussions between USAID and MRA reduced the list to Batumi, Poti, and Kutaisi.
3. Viewing the MRA proposed sites in Batumi, Poti and Kutaisi and meeting with local MRA and Municipality officials on the ground in those cities.
    a. The field visit for this was arranged and made on 24-26 April 2012. The trip participants were:
        i. Valeri Kopaleishvili, Head, Dept. for Settlement of Refugees, MRA
        ii. Bradley Carr, USAID, GMIP COTR
        iii. Teimuraz Levanishvili, Tt GMIP, Housing Rehabilitation Manager
        iv. Michael McGovern, PE, Tt Sr. Construction Manager /Engineer
        v. Mamuka Shaorshadze, Tt GIMP, EHS Specialist
        vi. Koba Tsiramua, Tt GMIP, Regional Engineer
4. Consolidating all design data and field visit findings, making certain assumptions, and developing a side by side comparison of the proposed sites.
5. Proposing a probable best site option as well as developing a preliminary project overview, preliminary on- and off-site development costs, and implementation schedule.

The review and investigation of the existing IDP building design, drawings, specifications and other data was performed by:

1. Carrying out a preliminary or high level IBC compliance design review of the building design and drawings;
2. Developing recommendations for a revised building design as well as a design and construction implementation plan;
3. Developing a revised building preliminary cost estimate based upon findings.

The preliminary UPA proposal was developed from findings of similar projects funded by USAID, NGOs and self-help groups internationally and in the Unites States.

C Existing IDP Housing Design Information and Cost Estimates

MDF transferred design notes, drawing, specifications, Bills of Quantity and other descriptive information of the new IDP Housing constructed during 2011 in Zugdidi and Poti to Tt in early May for review. MRA and MDF suggested that these designs might be reused for the proposed USAID housing under consideration in the study. Exploring this possibility is part of this study and the findings and results of this examination and review are included in a later section of this Study Report.

While on-site, MRA officials told the field team that IDPs prefer the four-story rectangular design buildings at Poti because they do not like walking up the five floors on the five-story

model. They also prefer that the apartments do not have open plan "great rooms" that include kitchens and living/dining spaces in one open area. They would rather have a separate kitchen from the living/dining area. Therefore, during the field visit the decision was made along with the MRA and USAID representatives to focus attention on the four-story Poti building design as the model for this Concept Study.

A review of the Poti "Type B" drawings and contract Bill of Quantities yields the summary information shown on **Table 1.** Each of these units has 32 total apartments (24 two bedroom and eight single bedroom) on four floors with a total exterior footprint of 428 SQM or 34.4 SQM/apartment on average. This is a relatively small apartment building. The bid cost for this building in 2010, not including VAT, was 969,225 GEL ($587,409) or 2,265 GEL /SQM ($1,372/SQM) or 30,288 GEL/apartment ($18,357/apartment). Note that this cost estimate has no off- and on-site grading, drainage, utility, road, sidewalk, or park/playground cost.

Appendix 3 also includes the GOG MRA distributed IDP Housing Minimum Standards. These standards lay out basic target information and definitions for any and all IDP housing such as floor area, utilities, appliances and some construction standards.

Both the MDF-provided drawings and the MRA standards do not refer to open space, park, playground, and sports areas, and parking in and around IDP apartments. Further the drawings and specifications provided by MDF did not include on-site utility, site grading, drainage design and/or drawing details. The drawings were for the buildings only.

TABLE 1- Poti Type B Four Story Apartment Block

Date of Drawings			Jul-09			
Features						
	Frame		Rectangular RC			
	Walls		External Internal Hollow Block			
	Roof System		GI Roofing w/Wood Trusses			
Floors			4			
Apartments			32			
	Double Bedroom			24		
	Single Bedroom			8		
Ceiling Height			2.75	M		
Outside Dimension						
	Length		32.40	M		
	Width		13.20	M		
	Height		12.35	M		
	Footprint		428	SQM		
	Const. Area		1,711	SQM		
	Tot. Area					
		Useable	1,101	SQM		
		Summer	59	SQM		
		Staircase	178	SQM		
		Commercial	212	SQM		
		Total	**1,550**	SQM		
	Total Volume		5,200	CM		
Cost						
1	Structural				781,222	83%
2	Electrical				48,138	5%
3	Water &Wastewater				78,044	9%
4	Gas				33,591	3%

TABLE 1- Poti Type B Four Story Apartment Block

Sub Total			**940,995**
Contingency	3%		28,230
VAT	0%		-
Total			**969,225**
Total USD	**@**	**1.65**	**$587,409**

D Sites Investigated, Issues, Development Costs and Selection

The Field Trip Team saw six sites in Batumi (2), Poti (1), and Kutaisi (3). Of these six observed, three sites, one in each municipality, was investigated. The original SOW for this Concept Study called for a weighted criteria scoring/ranking exercise to be carried out between the investigated sites that would result in a clear "best case" site selection. However, as only three sites were investigated, one of which became an untenable choice, the site selection issue as an outcome of this Study resulted in a choice between two sites. Given this, the ranking exercise is not presented herein as the choice between the two sites does not require such a sophisticated exercise.

1 Description of Possible Building Sites

Figure 1 (Appendix 5) is a general location map of Georgia and points out the location of the possible new IDP building sites in Batumi, Poti and Kutaisi. Today there are existing new apartment building complexes in Batumi, Poti and Zugdidi Municipalities. The complex in Batumi includes 22 buildings and in Poti the complex includes 32 buildings. **Figures 2, 3, and 4** are location maps for Batumi, Poti and Kutaisi. The maps show the locations of the proposed new IDP sites with a yellow "push pin" symbol. **Appendix 5** includes **Figures 1-4** and **Figures 5-7** discussed in this section and presents **Overview Photos** of each of the three sites studied.

a. Batumi

Figure 5 shows the proposed 47-ha site located adjacent to and east of the existing 22 IDP block complex to the northeast of Batumi Municipality and the older and more established Tamar subdivision to the north. The existing IDP complex houses approximately 580 IDP family residents (1,740 people) all from Abkhazia. Physically the site is generally flat, located in the coastal plain with high groundwater table, draining to the northeast. The site is located on an abandoned and partially dismantled mid- to large-size petro-chemical plant. There is also an existing natural gas storage facility to the southeast of the site that is fed by rail and pipeline. From time to time, this facility causes noxious odors in the existing IDP housing complex. Three large gas and oil pipelines run directly through or immediately adjacent to the existing IDP complex and would also be very close to the proposed site being considered in this Study. A second site in Batumi was considered as a possibility on the north side of the existing IDP Complex between the complex and the drainage channel (see **Figure 5**) This site was deemed unsuitable and dismissed for consideration due to the large amount of building waste dumped on-site, the large drainage channels cut across the site, and the swampy condition of the land that could be seen.

b. Poti

Figure 6 shows the proposed 30-ha site located northeast of the existing 32 IDP apartment block complex to the south of Poti Municipality. The large existing IDP complex houses approximately 1,070 IDP family residents (3,200 people) all from Abkhazia. Physically this site is larger than the Batumi IDP Housing site and denser than the Batumi IDP apartment block complex. The proposed Poti site is generally flat, located in the coastal plain with high groundwater table, draining to the northeast. The site is more or less clean except for some construction debris and there are some signs of demolished buildings. The existing IDP complex and the proposed site being studied here are located on the north edge of the Kolkheti National Park where several endangered species are present.

c. Kutaisi

Figure 7 shows the proposed 31-ha site, designated Kutaisi #1 located 6.6 km west of the downtown center of Kutaisi Municipality. The site is also 4.5 km west of the new Georgian Parliament building on the same road. The surrounding area features a large abandoned tractor plant adjacent to the site to the west and a regional prison across the main street to the west. The city limits of Kutaisi are also located near the prison, so while the site is technically outside municipal limits local MRA and Municipal staff report that the Kutaisi Master Plan includes the promotion urban growth in this corridor over the next ten years . The site is located on a wide flat plain and appears to consist of mostly undisturbed earth draining to the southwest. IDP collective centers are also located on this main road approximately 3 km to the east. Some of them are already included in the GMIP rehabilitation plan and others are aptly termed "collapsing collective centers."

Figure 4 shows two other Kutaisi sites. These were observed during the field visit. Kutaisi #2 is located on the right river bank of the Rioni River in the middle of Kutaisi. As the land was clearly in the river floodway and was bisected by major overhead power transmission conductor/cables and towers, it was determined that the site was unacceptable during the site visit. Kutaisi #3 is southeast of the municipality on the main road to Tbilisi. The site is located on another abandoned, demolished factory site. Old factory floor slabs cover much of the site and the remains of an old wastewater treatment plant (WWTP) are on the site as well. This old plant has an administrative building that was converted to IDP rehabilitated housing. While an interesting site in terms of its location and the fact that there was some IDP building rehabilitation work done here previously, this is another case of a site with remediation problems due to large amounts of industrial material, debris and waste on-site, a high groundwater table and perhaps thousands of tons of industrial construction debris littering the site. This location was also rejected on-site due to the obvious remediation and clean-up issues that would have to be addressed before any work could even begin here.

2 Sites Characteristics Matrix

Appendix 6 includes a detailed matrix of on- and off-site characteristic information under four broad headings for the three sites in Batumi, Poti and Kutaisi considered for selection in this study. This information was mostly gathered during the field trip but some comes from background information on IDPs and from discussions with others such as the

Norwegian Refugee Council. The characteristics reported upon include those listed in **Table 2**.

Table 2 - Site Characteristic Matrix Items	
A.	**Proposed Physical Site and Location Characteristics**
1	Land Ownership
2	Current Land Use
3	Area
4	Location
5	Neighbors
6	Shopping
7	Schools
8	Police and Fire
9	Hospital/Clinic
10	Public Transport
11	Solid Waste Removal
12	Parking
13	Zoning/Master Plan Issues
B.	**Socio-Economic Issues**
1	IDP Profile
2	Current Housing Situation
3	Employment Prospects
4	Reintegration Potential
C.	**Engineering/Infrastructure issues**
1	Access
2	Water
3	Wastewater
4	Electricity
5	Gas
6	Telephone
7	CATV
D.	**Environmental & Health Issues**
1	Air
2	Water
3	Soils
4	Flora and Fauna
5	Archeological

3 Site Selection

Reviewing the data presented in **Appendix 6**, it is apparent that the Batumi site has issues with the abandoned petro-chemical plant and the gas storage site to the southeast. It is recommended due to questions surrounding these environmental issues and the assumed high cost of site remediation required that the Batumi site be eliminated as a possible candidate for consideration.

The development of the Poti site is estimated to have a slightly lower cost than the other options because of the availability of off-site infrastructure. (See **Appendix 8)**. However, the Poti site will also have environmental issues such as high groundwater, proximity to a national park with endangered species, and less potential for reintegration of IDPs into a socially and economically productive environment because of the number of IDPs already

housed there in one concentrated area. To promote the GoG IDP reintegration policy it is preferred not to cluster IDPs in large, dense populations. Instead it is recommended to have them more evenly distributed throughout the region. Clustering IDPs into "project-like" complexes fosters a feeling of "containment" within the IDP community where "assimilation" is a preferred approach.

The Poti site would become part of a very large IDP complex there and conflict with USAID's IDP housing requirements. "The IDPs who were affected during the 1990s conflict were placed in unsuitable buildings while the IDPs who were displaced following the August 2008 war were placed in new but poorly constructed settlements with inadequate infrastructure (e.g., water and sewage systems). It is important to understand that the housing issue is just the tip of the iceberg of a larger problem. Poverty and unemployment among IDPs prevent them from maintaining their homes and from integrating into Georgian society. Therefore, any housing program developed needs to be designed using an integrated approach that provides IDPs with not only adequate housing, but also the tools for self-reliance." (USAID Action Memo Approval of IDP Project) USAID is emphasizing the importance of social integration and is therefore very reluctant to invest in housing that groups large numbers of IDPs in the same apartment development as is the case in Poti. Rather, small to medium sized local solutions are sought that will enable IDPs to continue living in the areas where they have already established economic and social networks and not be relocated into densely IDP populated areas.

From the Site Matrix we can see that the existing Poti IDP complex only receives potable water for four hours each day. A sewage treatment plant is being constructed now for this development. This means that raw wastewater from this development is currently flowing into tidal estuaries near the national park. Additional housing will only exaggerate this environmental problem.

The Mayor of Poti was adamant that site service coverage would improve shortly, that Poti would have new industry starting up in the near future that would create job opportunities for IDPs and that the site of the existing complex was set up to include 60 apartment blocks or 28 additional in the near future. However the Master Plan for Poti has not fully addressed these issues.

The selected Kutaisi site offers what appears to be the best looking property in terms of an undisturbed site and one that will house less than 500 IDPs in the same area. It is also located close to the new Georgia Parliament building which may mean the site would have more positive political exposure and city expansion is reportedly moving in the direction of this site. The site is near existing GMIP projects that will soon come on line and there is also a Kutaisi GMIP Office meaning there would be Tt engineering support nearby during construction. There are also IDP "collapsing collective centers" nearby that could be the source of new IDP residents for this project. If we assume that this project will provide 160 new apartments this translates to 160 families (480 people); perhaps Kutaisi IDPs in "collapsing collective centers" are prime candidates for assistance.

Existing Kutaisi utilities (water, wastewater, gas and electric) are also said to be available in front of the existing prison. This will require more study and verification in a feasibility or pre-design stage but the Kutaisi Municipality representatives were insistent that providing utilities for this new development would be no problem; that there was sufficient excess capacity in the systems now.

Given the results of this investigation, Kutaisi seems the best choice for the site of this proposed USAID-funded IDP new housing apartment complex.

E Review of Existing Building Drawings and Designs

Tetra Tech reviewed the Type B Poti Design for compliance with IBC. The drawings were reviewed for compliance under architectural, structural, mechanical, electrical and plumbing disciplines. The Tetra Tech review matrixes are included as Appendix 10, IBC Compliance Review. The review was limited to life safety issues and should not be considered a complete list of drawing deficiencies.

1 IBC Compliance

The building design has serious IBC deficiencies and a number of life safety issues that could have catastrophic consequences. The following is a compiled summary. See Appendix 10 for the full review.

- Architectural requirements for fire safety including sprinklers, fire alarms, fire rating, and emergency egress are insufficient.
- Structural requirements for seismic design have not been met.
- Mechanical requirements for venting and exhaust of gas heaters is not addressed on the plans. The use of schedule 40 PVC for gas piping does not meet IBC.
- Plumbing requirements for materials, layout and ventilation are insufficient.
- Electrical requirements for grounding and cable size do not meet IBC.

2 Architectural Issues and Suggestions

- This building will need to be fully equipped with a sprinkler system.
- Redesign to connect corridors so that stair towers can be shared or add 2 more 4 story stair towers (still involves redesign to access additional stair towers).
- Enclose stair towers to separate from the interior of the building, entrance to some of the flats will need to be redesigned (this can be accommodated in item 2 redesign).
- Additional metal work will be required to make the guardrails compliant and handrails need to be added to the stairs.
- A 1 hour fire-rated hatch will be needed in lieu of the tin cover called out at the attic access.
- (32) 20 minute fire-rated doors need to be used in lieu of the non-rated entrance doors to each flat.

- Window sizes and types need to be redesigned to provide emergency escape and rescue openings for sleeping rooms on the 3rd story and below.

Changes to accommodate MRA IDP Housing request:

- Separate the kitchen from the dining/living area. This appears to be possible by adding a wall and a door to each double room flat; some slight redesign may be needed to accomplish this in the single room flats.

3 USAID Requirements – PWDs, Energy Efficiency

- Tetra Tech recommends that a waiver be issued from strict compliance with the requirements to construct the entire building in compliance with the USAID Policy on Standards for Accessibility for the Disabled in USAID-Financed Construction, to allow only the first floor to be designed in accordance with the policy. This will eliminate the requirement for elevators. These are expensive to install and maintain and if not properly maintained will leave disabled persons stranded on upper floors.
- Recommend that the (International Energy Conservation Code) IECC be used as a guide to increase the thermal performance of this building.

F Proposal for IDP Urban Agriculture

The land available for the development of the IDP Housing in Kutaisi sits upon a large government owned parcel of 31 ha. The new IDP development will require perhaps 1.8 to 2.0 ha. Given the high rate of IDP unemployment and the need for fresh food, it is recommended that USAID consider working with GOG to obtain an additional 16 ha (each apartment would have a one tenth ha (1000SQM) land allowance) for use by IDPs living in these new blocks for urban, peri-urban agriculture (UPA). A board definition of UPA follows:

> Urban agriculture can be defined shortly as **the growing of plants and the raising of animals within and around cities.** The most striking feature of urban agriculture, which distinguishes it from rural agriculture, is that it is **integrated into the urban economic and ecological system**: urban agriculture is embedded in -and interacting with- the urban ecosystem. Such linkages include the use of urban residents as laborers, use of typical urban resources (like organic waste as compost and urban (gray) wastewater for irrigation), direct links with urban consumers, direct impacts on urban ecology (positive and negative), being part of the urban food system, competing for land with other urban functions, being influenced by urban policies and plans, etc. Urban agriculture is not a relic of the past that will fade away (urban agriculture increases when the city grows) nor brought to the city by rural immigrants that will lose their rural habits over time. It is an integral part of the urban system.[1]

[1] RUAF (Resource Centers on Urban Agriculture and Food Security) Foundation Webpage, http://www.ruaf.org/node/512

As noted this is not rural agriculture and as such it should not be designed and managed as another agriculture project. These types of projects have strong community involvement and self-help components. They are also characterized as successful only if sustainable. USAID is funding UPA projects in Ethiopia and the West Bank today. The Ethiopia project targets women in development while other UPA projects in the US target youth at risk. The USEPA also has webpage for the promotion of community gardens as a means to ameliorate brownfields.

The overall benefits of such a successful initiative could not only be highly advantageous to this development, this could serve as a model to be followed in other IDP public housing complexes as well. Such benefits might include the following:

- IDPs will have better access to local, affordable, nutrient-rich produce;
- IDP food security will improve;
- UPA creates savings in household expenditure on consumables, thus increasing the amount of income allocated to other uses;
- "Green-collar" employment opportunities might arise for IDPs increasing economic stability;
- Neighborhoods burdened with environmental hazards will contain oases of greenery and healthy, remediated soil;
- Overall, UPA improves the quality of the urban environment through greening and thus, a reduction in pollution;
- Urban agriculture saves energy (e.g. energy consumed in transporting food from rural to urban areas);
- Areas impacted by crime could be positively impacted by productive, interactive activities; and
- IDPs would be building a sense of community and they would have opportunities to channel energy and build their community.

The potential for such an initiative deserves study and consideration however as noted above, this is not rural agriculture and specialist input is needed to design a simple cost effective program and then return and help "jump start" it once IDPs are living in the new apartment complex.

G Concept Level Design on Best Site Option and Possible Next Steps

Following the recommendation of this report, that Kutaisi #1 is the selected site **Figures 8 and 9** in **Appendix 7** illustrate a possible layout of five apartment blocks that have the same exterior dimensions as the existing Poti four-story blocks. The site requires approximately 1.8 ha. This layout is somewhat tight and is located close to the existing small private property holdings along the road but it does show that there is sufficient land

for the project. This layout includes sidewalks, a park, playground and some parking and athletic courts.

A final layout should be done with the assistance of an architect and should include more MRA and USAID input and perhaps input from potential IDP residents. Wind and sun exposure site data also should be used to site these buildings properly.

Some issues that need to be considered in next steps:

1. **Site Utilities**: The field trip team did not see utility drawings that show the location and the size of nearby utilities that this project will rely upon for service. Normally these types of drawings exist and need to be checked in order to ensure that the necessary nearby utility capacity exists. As an example, the cost estimate in this study for instance relies upon a proposed gravity wastewater line running towards the existing prison for wastewater service. This may not be practical as the land is sloping up towards the prison. A WW pump station may be needed to service the site. Once definite utility ties are located, the off-site cost estimate can be updated. This information needs to be confirmed as one of the first steps.

2. **Overall Building and Infrastructure Design**: The design of the new buildings needs to be carried out using the IBC. Georgian A/E firms have this expertise and one should be selected through the MDF procurement process to carry out this A/E work. However, to ensure IBC compliance it is recommended that the Tt Home Office provide design review and approval on this work.

3. **Inclusion of Site Grading and Drainage Plan in the Design and Construction**: As noted earlier in this report, the Poti and Zugdidi designs and drawings examined did not include any site plans for grading and/or drainage. This is essential for a complete and well-functioning project and it is necessary for this project.

Compliance with USAID PWD Policy: Designs need to include compliance with the USAID Policy on Standards for Accessibility for the Disabled in USAID-Financed Construction

4. (PWD policy) at least for the first floor. Existing handicap ramps observed in Poti and Batumi were poorly constructed and not sufficient to provide the service intended. These facilities require proper design and not an afterthought. It should also be noted that providing service to only the first floor will require a policy waiver.

5. **MDF Procurement**: It is assumed that a new project such as this will require MDF engagement of:
    a. A/E Services for design studies, architecture and design; and
    b. Construction Services.

In the case of the A/E services procurement, consideration should be given to carrying out a prequalification exercise prior to bidding to ensure that only firms with experience designing using the IBC can bid.

6. **Construction Quality**: While on the field trip, observations of the existing Batumi and Poti IDP housing complexes revealed questionable construction quality in the site work, the building exteriors and interiors. Tt will pay close attention to ensuring construction quality during the course of the design and construction of this project.

7. **UPA Consultant**: If the UPA proposal receives traction, it is recommended that USAID bring out a professional UPA consultant from the US to help design and manage the first few months of this program (perhaps two trips are required). This is not rural agriculture and it is unreasonable to think that without some professional assistance this effort will be successful. Specialist development expertise is required. This should not be viewed as a side project that can be taken on by UNHCR. This is a pilot that could offer some relief to unemployment, additional food and perhaps some positive outlook benefits to urban IDPs.

H Conceptual Level Cost Estimate

It is important to preface this section with a reminder that cost data presented here is preliminary and actual project costs can vary significantly from these estimates. As such, before arranging project financing some additional cost investigation is recommended and discussed herein. Also for the purpose of this study all USD to GEL conversions are based upon a rate of $1 USD equal to 1.65 GEL.

One objective of the Study is to develop a proposal that costs approximately $5 Million (GEL 8.25 Million). This was the starting point for this proposal.

1 On- and Off-Site Development Costs

Appendix 8 includes a cost estimate of on- and off-site infrastructure to serve this proposed new development for all three sites investigated: Batumi, Poti and Kutaisi. The unit costs used are taken directly from the publication: *Prices of Construction Materials (1st quarter, 2012)*, the Union for Construction Evaluation[2], Tbilisi, 2012. In perhaps one third of the items, the cost has been increased to reflect recent bid history with MDF bid unit prices and experience from other similar projects internationally. The quantities are rough estimates made from assumed location of existing utility service hookup and assumed construction material quantities.

[2] #5 Z. Chavchavadze Str. (former SHerozia Str.), Tbilisi, Georgia
Tel:(995 32) 2 95 95 88, Fax: 2 95 95 88

2 Building Costs

The proposed building costs shown in **Table 3** have been estimated by adjusting the Poti Type C Building cost estimate to comply with IBC requirements. A summary of these adjustments is also included in **Appendix 10**.

3 Overall Project Estimated Costs

Table 3 summarizes all estimated building and off- and on-site cost estimates for this proposed project.

Table 3 - Buildings, Off- and On-Site Work Estimated Cost		
#	**DESCRIPTION OF SERVICES**	**TOTAL COST (GEL)**
a	*b*	*c*
A	**BUILDINGS**	
1	Structural	1,066,219
2	Power Supply Mains	62,580
3	Water, Wastewater, HVAC	98,327
4	Gas Supply	51,875
	SUBTOTAL ONE BUILDING	**1,279,000**
	SUBTOTAL FIVE BUILDINGS (A)	**6,395,001**
B	**OFF- and ON-SITE WORK**	
1	Total for Streets, Parking	427,707
2	Total for Lanscaping, Parks, Playground	91,228
4	Total for Grading and Drainage	143,034
5	Total for Gas Supply	52,092
6	Total for Electric Work	109,418
7	Total for Water Supply	79,729
8	Total for Wastewater	72,717
	SUBTOTAL SITE WORK (B)	**975,925**
C	**TOTAL (A + B)**	**7,370,926**
1	CONTINGENCIES @ 3%	221,128
D	**GRAND TOTAL**	**7,592,054**
E	**GRAND TOTAL (USD)**	**$ 4,601,245**

I Concept Level Schedule – Design Studies, Drawings & Specifications, Procurement, Construction, Handover

Appendix 9 includes an illustrative schedule of activities and notes for each step that would be required to move this proposed project from USAID advising MDF to beginning a Pre-Construction Conference. This includes starting and completing an ESS and EA, procurement of A/E services, design studies and production of drawings and specifications, and procurement for construction. It is estimated that these tasks would require approximately eight months. Discussions with local Georgian engineers and contractors confirm that the project construction could be completed in 12 to 14 months. Therefore it is estimated that this project would require 20 to 22 months to complete.

APPENDICES

1. Map of Georgia
2. Brief Overview of Achieved Results Regarding IDP Housing
3. MRA IDP Housing Standards
4. Field Notes (Teimuraz Levanishvili, Mamuka Shaorshadze, Koba Tsiramua)
5. Figures 1-7 – Batumi, Poti, and Kutaisi Site Maps and Site Photographs
6. Batumi, Poti and Kutaisi Site Characteristics Matrix
7. Figures 8-9 – Proposed Kutaisi Site Layout
8. Batumi, Poti, and Kutaisi Off- and On-Site Cost Estimates
9. Proposed Implementation Schedule
10. IBC Compliance Review

APPENDIX 1 – MAP OF GEORGIA

APPENDIX 2 – BRIEF OVERVIEW OF ACHIEVED RESULTS REGARDING IDP HOUSING

Brief Overview of Achieved Results Regarding IDP Housing

By: Tamar Karchava, MRA
1 May 2012

There are approximately 88,500 IDP families in Georgia (265,100 people). To date, out of the total IDP families 28,553 IDP families have been provided with durable housing solutions throughout Georgia as follows:

Types of Housing Provided	IDP families
Rehabilitation of Community Centers	4,357
Rehabilitation of Idle Buildings	1,928
Quick Fixes and Transfer Buildings without Rehabilitation	10,886
Cottages (NCL IDPs)	4,878
Rehabilitation of Idle Buildings (NCL IDPs)	1,116
Monetary Assistance for DHS	5,388
Total N of IDPs with housing	**28,553**

Additionally, in 2011 new apartment blocks were constructed to meet the housing needs of the IDPs of the first priority living in "collapsing CCs"; CCs that should shortly be closed; and extremely vulnerable IDPs living in private sector provided housing who are in need of DHS. The gap of 6,012 of these affected IDP families still exists.

	Collective Centers			Families in		
	Collapsing CCs	***To be Closed***	***Total CCs***	***Collapsing CC***	***To be Closed***	***Total Families***
Before Constructions	102	344	446	2,341	5,215	7,556
Closed CCs and Families with DHS in Constructed Blocks	18	31	49	844	700	1,544
Gap after Constructions	84	313	397	1,497	4,515	6,012

Out of the 7,756 IDPs residing in such CCs 1,544 IDP families were provided with living spaces in the newly constructed blocks in Batumi, Tskaltubo and Poti; the cities are developed and offer good livelihood opportunities. 57 IDP families from other buildings and 265 extremely vulnerable IDP families were also provided with DHS.

Constructed blocks	N of resettled IDP families		Total
	From CCs	PA	
Poti	844	128	972
Batumi	413	137	550
Tskaltubo	344	0	344
Total	1,601	265	1,866

The IDPs resettled were mainly from Imereti and Samegrelo. Categories of CCs from which IDPs were relocated are given below:

Type of buildings	Total N of buildings	Total N of IDP families	Imereti					Samegrelo			
			CCs	N of families	Poti	Batumi	Tskaltubo	CCs	N of families	Poti	Batumi
Already closed CCs											
Collapsing	18	433	5	345	30	17	298	13	88	76	12
To be closed	31	186	3	28	15	1	12	28	158	136	22
Partially vacated CCs											
Collapsing	24	411	13	383	152	198	33	11	28	20	8
To be closed	84	514	18	247	104	142	1	66	267	259	8
Other Buildings	10	57						10	57	52	5
	167	**1,601**	**39**	**1,003**	**301**	**358**	**344**	**128**	**598**	**543**	**55**

One of the developing cities in Georgia is Kutaisi, the city which will host the Parliament of Georgia. Kutaisi, Batumi and Poti could be the location for future construction work to settle the IDPs there.

The general statistics of IDPs in the cities are given in the chart below:

	No of IDPs	No of families	No of IDPs in PS	No of families in PS	No of IDPs in CCs	No of families in CCs
Kutaisi	13,321	4,206	8,890	2,798	4,431	1,408
Batumi	3,893	1,331	3,741	1,261	152	70
Poti	10,248	3,043	8,402	2,504	1,846	539

Developing cities are not the main and only solution. Some IDPs with agricultural backgrounds prefer to get rural housing in the villages with access to the land. With support of UNHCR and SDC 38 houses with land were bought in Samegrelo and Imereti so far.

APPENDIX 3 – MRA IDP HOUSING STANDARDS

The main purpose of the document on "Standards for Rehabilitation, Reconstruction and Construction of Collective Centers to provide the long-term shelter for IDPs" is provision of all refugees with the relevant dwelling. All dwellings should satisfy these standards. The dwelling which is not in compliance with the abovementioned document may not be considered as a long-term shelter for refugees. The main principle is that refugees will stay in their current residence, in case of their agreement, and will be provided with long-term accommodation, which is appropriate to the standards given in the document. In cases of displaced families living in conditions not corresponding with these standards and where it is impossible to rehabilitate dwellings in accordance with standards, an alternative decision should be taken to ensure their long-term housing. Exception should be made only when refugees abandon their right to receive alternative accommodation and express the wish to stay at their residence.

These standards will serve as a guidance document for refugees in terms of awareness of their rights regarding provision with long-term accommodation and will serve as a tool for the Government partner organizations, and the Supervisory Board during the long-term housing program planning, implementation and supervision process, which includes (but is not limited to) the following:

- Evaluation of rehabilitation or assessment of the possibility of adapting existing collective centers, and preparation of collective centers categorization.
- Reconstruction of existing empty buildings for long-term dwellings.
- Construction of new long-term residences for refugees.

In the occupied collective center buildings to be rehabilitated (as opposed to the new buildings or empty ones), some families are holding more space than is specified in accordance with the standards. In cases when several displaced families occupied the spaces with a big difference, and in the buildings where the space is needed for other families, a transparent process should begin, which will help refugees get the right/fair solution to eliminate above mentioned unfairness.

MRA Standards for Rehabilitation, Reconstruction and Construction of Collective Centers to provide the long-term shelter for IDP's

All rehabilitation, reconstruction and construction works will be performed in accordance with Georgian legislation and regulations.
When a family has a handicapped member / members the project design has to consider apartment accessibility for handicapped persons.

Parameter	Units	Standards		Comments	
		Base Standards for New Constructed Buildings and Empty Buildings to Be Rehabilitated	Base Standards for Rehabilitation of IDP Collective Centers		
Residential Area (excluding bathroom)	m^2 per flat	25 - 35 m^2	More than 15 m^2 for each resident plus additional 5 - 8 m^2 for each extra resident	One room flat	1-2 residents
		40 – 45 m^2		Two room flat	3-4 residents
		50 – 60 m^2	Except when it is not technically possible or offer is rejected by the beneficiary (see explanatory document), the recommendations for number of residents per room should be reserved	Three room flat	5-6 residents
		Additional 5 m^2 for each extra resident			For each extra resident (for 6 over member families)
Bathroom	each	one in each flat	one privately owned and isolated bathroom on the same floor	within the flat	Bathroom plus shower with hot water plus sink with hot water
					Sub-floor drainage channel in the shower
					Positive ventilation system.
					White tiled floor with walls painted by water emulsion paint
Kitchen	each	one in each flat	one in each flat	within the flat	Sink plus stove, hot and cold water, all water and gas lines within the wall. Tile splash blocks.
Doors and Windows	number of doors and windows in each room	1	1	There should be no windowless room in the residential area	Double glass windows
Heating		1	1	Each flat will be provided a heating system through a gas feed or from a wood stove. A kitchen wood stove with flue should also be considered	
Flue				The wood stove should be served by outdoor flues and the length of the flue will be in accordance with State Standard of 1977	
Walls				If possible, the existing partitions will be maintained. In case of new construction, soundproof materials (knauf insulation or equivalent) will be used	
Wall Covering		painted walls		Walls in the kitchen will be painted by water emulsion paint	
Floor				In case of floor replacement, the laminated parquet should be used. When needed, additional subflooring shall be arranged	

All rehabilitation, reconstruction and construction works will be performed in accordance with Georgian legislation and regulations.
When a family has a handicapped member / members the project design has to consider apartment accessibility for handicapped persons.

Parameter	Units	Standards		Comments
		Base Standards for New Constructed Buildings and Empty Buildings to Be Rehabilitated	Base Standards for Rehabilitation of IDP Collective Centers	
Electric System				Electric system to be installed must give possibility to each family use powerful electric equipment
Construction of the Building and Shared Space				Repairing of the roofs, parts of the stairs, walls, sidewalks, facades, and water pumps should be performed in accordance with applicable standards that allows for avoiding further damage, ensuring population security, such as railings on the stairs, waterproof roof, etc. Special attention should be paid to the security of shared spaces. Non-shattering glass should be used in shared places
Shared Utilities	Water Supply and Sewage			Internal communications must be installed in accordance with the water / sanitation facilities standards
				External Communications are under responsibility of local government. Contractor or Contractors have to carry out installation of the external communications as directed by the local authorities
	Electric Network			Internal network must be installed in accordance with the relevant facilities standards
				External Communications are under responsibility of local government. Contractor or contractors have to carry out installation of the external communications
	Gas			Internal network must be installed in accordance with the relevant facilities standards
				External communications are under responsibility of local government. Contractor or contractors have to carry out installation of the external communications
Protection from Dangerous Substances				Any building can contain dangerous building materials, such as: lead paint, hazardous substances (PCB, for example) containing electrical transformers, etc. In this case, research should be conducted by the organization with the relevant experience. If hazardous materials are discovered, they should be removed from the building

APPENDIX 4 – FIELD NOTES (Teimuraz Levanishvili, Mamuka Shaorshadze, Koba Tsiramua)

Mamuka

Preliminary Environmental, Health, and Safety information

Batumi

Site 1

The area of the territory which MRA proposes for construction of new IDP buildings is about 4.7 ha and is located next to the new IDP housing settlement. When conducting a visual inspection of the site the following was discovered: there is reinforced concrete debris (big and small pieces), which are hazardous. The surface is covered with a soil excavated during the construction of 22 new buildings. The top soil and sub soil are mixed together. There are different sorts of trees and grasses grown on it. In the middle of the territory there are 20-30 fir trees and some other sort of trees.

During the conversation with the local population it was found that in the 80's and 90's a petro-chemical plant was functioning on that territory. The locals report that 60 % of the territory was occupied by an oil refinery plant, the remains of which still exist there. Some of the facilities located next to the site which are fenced in with wire are still operational. On the upper part of the plot there is so-called special zone with a sign saying "Control Zone". There are two big pools containing hazardous oil remains. Those remains are mixed with the ground inside and outside of the territory. There is a specific unpleasant smell on the territory which could have a bad effect on the health of the population living in a new settlement. A 100-mm oil pipeline crosses the territory with oil flowing inside; also a high voltage electric cable goes in the same direction. On the other side of the street there is a channel and 100-mm wastewater pipes are connected to that channel. A swampy area covers 20-25 % of the territory, and there are three to four pools full of different sorts of frogs and insects. The existing, unsanitary insects and mosquitoes can cause problems for the population especially in hot weather. A visual inspection showed that there are no archeological remains on the territory. However. it will be necessary to conduct archeological and geological surveys to avoid any threat to cultural and archeological legacy.

The proposed territory is not far from the public facilities. The distance to the nearest school is 2 km, to the polyclinic - 1 km, to the police station - 1 km. Public transportation is available there. According to governmental representatives 20-30% (50 self-employed) of the population is employed. In the near future, a new sewing factory and railway "dead head" with storage and other facilities are slated to open nearby to the settlement. IDPs and local population will have the opportunity to get some jobs there.

From an environmental and social point of view the territory is highly contaminated, ecologically dangerous and socially unstable. My recommendation is that the proposed territory must be cleaned up. The contaminated ground and industrial wastes should be disposed of in a special place. All preventive measures should be taken to avoid any threat to the population and environment.

Batumi

Site 2

The territory is contaminated with industrial and organic wastes which can be a threat to both people and nature. The total area of the territory is 1.6 ha. In the middle of the site there is a trench (ditch) with groundwater and rainwater inside which is mixed with the wastes. It represents a so-called garbage pit. Many different diameters of pipes can be seen in the trench from old underground communications. The territory has been used as a garbage place for many years and has been leveled many times with a grader. Plastic and polyethylene remains are everywhere.

From an environmental and social point of view the territory is highly contaminated, ecologically dangerous and socially unstable. My recommendation is that the proposed territory must be cleaned of all contaminated ground, industrial and organic wastes. All necessary preventive measures should be taken to avoid any threat to the population and environment.

Poti

Site 1

After a visual inspection it is clear that there is an original ground on the proposed territory and that it is suitable for construction. Some part of the soil will have to be removed from the territory during the grading works. The total area of the territory is about 3 ha. The surface of the whole territory is uneven and there are 10 fir trees. There is garbage, industrial and organic wastes on about 30-35 % of the territory. It contains the remains of reinforced concrete, plastic and polyethylene. At one of the edges of the territory there are two ruined buildings with remains of reinforced concrete and foundation.

The site is located next to a new IDP housing settlement with 32 houses. While 4,500 IDPs are registered there, only 3,200 IDPs are at the complex now. 800 IDPs were living in Poti in different locations. They receive a monthly IDP allowance of 28 GEL. 150 people in the territory are employed. The unemployment rate is about 90%. In the near future a new metallurgical factory, two mill factories and a logistical center are to open in the territory. IDPs and local population will have the opportunity to get some jobs there.

The proposed territory is not far away from the public facilities. The distance to the nearest school is 200 m, to the kindergarten – 300 m, and to the policlinic - 300 m. A police station is set to be built in the near future close to the settlement about 500 m away. Public transportation is available there. The settlement is located next to the main road. There is a new basketball stadium in the territory.

The grading work on the site will require some old soil to be removed and new soil to be put and compacted in some places of the territory. After completion of the construction works the bio restoration works will need to be carried out.

Kutaisi

Site 1

The total area of the territory which MRA proposed for construction of new buildings is about 30 ha. A visual inspection of the site shows that there is an original ground on the territory which creates suitable conditions for construction. Top soil should be removed in some places during construction. There are no trees on the territory, only some bushes. In some places there are some remains of industrial wastes which should not pose a big problem. High voltage electric cables cross the territory five to six poles of which are inside the site. The proposed land is located at the end of the town next to the automobile factory; therefore the public facilities are a bit far away from the site. The distance to the nearest school and kindergarten is about 1 km, to the policlinic – 2.5 km, to the Police station – 2 km. Public transportation is available there. The site is located next to the main road which is one of the main entrances to Kutaisi.

At the edge of the territory, there is a railway line leading to the automobile factory. The site is separated from the factory by a 4 meter high concrete wall.

Based on a visual inspection there are no archeological remains in the territory, but this should be investigated further because the large size of the area suggests there is a good possibility of finding archeological remains. However, the territory should have been well examined previously because there is factory adjacent to it.

That proposed territory does not represent any threat to the environment and construction can be undertaken without any problem. Prior to construction, archeological, geological, zoological and biological surveys should be conducted to avoid any negative impact on flora and fauna.

Kutaisi

Site 3

The proposed territory is located at the entrance of Kutaisi and is convenient in terms of access to public transportation. The area of the territory is 4.7 ha. All necessary public facilities are close to the site making life easier for IDPs. The Police station is 2 km away from the site, school -1.5 km, kindergarten -1.6 km, hospital -2 km, and the state university -0.5 km. There is a football field for the Kutaisi football team about 150 m from the site. Next to the site there is a military base.

On 1/3 of the territory there are concrete slabs arranged on the ground which should be removed and disposed of properly if construction starts. There are also the remains of reinforced concrete scattered all over the territory. Organic wastes are prevalent and there are broken asbestos slates which are radioactive and must be removed and disposed of in a special way. There are three to four big holes on the site with plastic wastes inside.

There are three 2-m long trenches on the site with groundwater inside. There is a wastewater plant on the territory which is now full of rainwater. The concrete walls of that reservoir are damaged and the water is leaking getting into the ground.

There is a 25-m long and 3-m high top soil and subsoil mix in the middle of the territory where some grass grows.

There are 10 trees of different sorts with 50-60 cm trunk diameters.

In terms of environmental, social and safety issues the territory is highly contaminated and ecologically dangerous. My recommendation is that the territory be properly cleaned up. All

dangerous waste must be removed from the territory and disposed of in a special place. All necessary preventive measures should be taken to avoid any threat to the population and environment. Water must be pumped out from the reservoir to avoid contamination and erosion of the ground.

Temur

Report

Tetra Tech

Date: 24-26 April, 2012

Location: Batumi, Poti, Kutaisi

The purpose of the site visit was to conduct a visual survey to find a location for construction of new buildings for IDP, to meet with local municipal authorities and MRA representatives, and to obtain all necessary information on the following:

- ownership issues
- site area
- geological studies
- underground communication
- determine the closest connecting points to the utilities (water, electric, gas supply, telephone and CATV)
- social conditions
- employment prospects
- preliminary engineering conclusions

USAID Georgia, Tt representatives: Mike McGovern, Temur Levanishvili, Mamuka Shaorshadze and Koba Tsiramua conducted site visits to five sites.

Site visit # 1

Address: Batumi, Abkhazeti street.

Persons met: Head of Administration of MRA (tel: 595 113390) -Valeri Kopaleishvili-, Deputy Minister of Health and Social issues of Ajara region – Mr. Ramaz Jincharadze (577 304505), Head of Ajara Urbanization department – Nugzar Dzneladze (577 203727).

After a conversation with the above mentioned persons, the following was determined: the territory is a state property with an area of 47,035 m2, they have no geological studies on the land and no map for underground communications. The approximate distance to the closest connecting points for the utilities are: for water supply - 800-1000 m, wastewater - 500 m, electric system - 800 m, gas line - 800 m, telephone cable - 600 m. TV and fiber cables do not exist in the neighborhood.

The nearest school is located 2000 m away, kindergarten 1000 m away, medical facility and police - 1000 m. Public transportation is available in the settlement.

The site is located next to the new IDP housing settlement with 22 buildings. 20 buildings are four-story the other two buildings are five-story. In total 580 IDP families live in that settlement. Two IDP representatives were interviewed: Omari Bedenashvili (599 412557) and Temur Gamisonia (599 655940). The conversation revealed that there is water in the basement of the buildings. 85-90% of the population is unemployed, and employment prospects are low.

Preliminary engineering conclusions: on the east part of the territory there is gas storage and distribution terminal which should be kept a minimum of 1000 m away from the construction site. Oil and gas pipes (d-400 mm) lie 1.5 m below the ground surface. There is a lot of oil waste and industrial debris on the site, as well as a large, old, open reservoir. Excavated soil from the foundation trenches of the new buildings has been placed there (approximate volume 47,035 m2 x 0.8 m = 37,628 m3 x 1.3 = 48,916 m3 x 1.4 (density) = 68,483 ton. Removal of soil to 5 km away from the site would cost 68,483 t x 2.98 GEL = 204,079 GEL. Grading of the territory by bulldozer labor/hr -29.3 GEL x 80 (10 days) =2,344 GEL. Prior to construction geological and topographical surveys must be carried out.

Conclusion: taking into consideration the above mentioned, the site is not cost-effective for housing construction due to high additional expenses.

Site visit # 2

Address: Poti, Sokhumi and Gagra streets.

Persons met: Poti Mayor – Vakhtang Lemonjava (tel: 577 957788), MRA representative in the district – Kakha Kechekmadze (tel: 595 113417), Municipality Specialist – Marina Khurtsilava (tel: 558 249 153)

After a conversation with the above mentioned persons, the following was determined: the territory is a state property with an area of 30,110 m2, there is no geological conclusion on the land and no map for underground communications. The approximate distance to the closest connecting points for the utilities are: for electricity -100 m and gas line - 100 m. Water is supplied for 4 hours a day, but after rehabilitation of the water system it will increase to 7 hours a day. Construction of a sewerage plant with a capacity of 5500 m3 is under way and telephone, TV, and fiber cables do not exist in the territory.

The nearest school is located 200 m away , the kindergarten 300 m away, and the medical facility 500 m.

The site is located next to the new IDP housing settlement with 32 buildings. When some of the IDPs were interviewed, they mentioned that there is water standing in the basement of the buildings. During heavy rain, water gets into the porch. Solid (organic) waste is removed from the bunkers regularly. 85 % of population is unemployed and employment prospects are low.

Preliminary engineering conclusions: based on the visual assessment for grading of the territory it will be necessary for new soil to be placed, compacted and leveled. The rough estimation of imported soil follows: approximate volume 30,110 m2 x 1,5 m = 45,165 m3 x 1,4 (soil density) =63,231 ton. Provision of soil from 5 km away from the site by lories would cost 63,231 t x 2.98 GEL = 188,423 GEL. Grading of the territory by bulldozer labor/hr -29.3 GEL x 64 (8 days) =1,875 GEL. Compaction of soil labor/hr -20.48 GEL x 80 (10 days) = 1,639 GEL

Prior to construction geological and topographical surveys must be carried out.

Note: based on a request from local authorities six apartments must be allocated to six non IDP families.

Conclusion: taking into consideration the above mentioned, the site is not cost-effective for housing construction due to high additional expenses.

Site visit # 3,

Kutaisi, site 1

Address: Kutaisi, the last section of Autokarkhana district.

Persons met: Head of Administration of MRA (tel: 595 113390) -Valeri Kopaleishvili, Head of Infrastructure Department of Kutaisi- Giorgi Tsuladze 9595 114470), Chief Specialist of Property Management Department of Kutaisi- David Gogrichiani (577 722636)

After a conversation with the above mentioned persons the following was determined: the territory is a state property with an area of 31,559 m2. The ground is of the 3rd soil category, with a layer of clay. The groundwater table is about 3 m below the surface. Wind speed 39 m/second. A D-600 mm old water pipe might lie underground in the territory.

The approximate distance to the closest connecting points for the utilities: for electricity, gas line, sewerage system and water line is about 600-700 m. The situation with regards to TV, telephone and fiber cables needs to be clarified.

The distance to the nearest school and kindergarten is about 1 km, to the policlinic – 2.5 km, to the Police station – 2 km. Public transportation is available there. The site is located 15 m away from the main road. It is possible for land plots to be allocated to the residents for small vegetable gardens. There are no foreseen obstacles for the construction works.

Conclusion: the site can be recommended for construction of new buildings.

Site visit # 4,

Kutaisi, site 2

Address: Kutaisi, near Nikea street.

Engineering conclusion: the site with an area of 30,000 m2 cannot be considered for construction purposes, because there is a huge amount of garbage and waste on the territory; it is very close to the river; and most importantly, overhead high voltage cables cross the territory. According to the building standards and technical norms it is prohibited to build houses on such a territory as it may negatively affect people's health.

Site visit # 5,

Kutaisi, site 3

Address: Kutaisi, 3 turning, Akhalgazrdoba street.

Persons met: Head of Administration of MRA -Valeri Kopaleishvili, Head of Infrastructure Department of Kutaisi- Giorgi Tsuladze, Chief Specialist of Property Management Department of Kutaisi- David Gogrichiani.

The territory is a state property with an area of 58,000 m2. They have no geological studies on the land and no map for underground communications. The approximate distance to the closest connecting points for the utilities are: for sewerage system, electricity and water line – 600 m, and for the gas line - 700 m. Telephone, TV and fiber cables do not exist on the territory.

The Police station is 2 km away from the site, school -1.5 km, kindergarten -1.6 km, and the hospital 2 km. The site is located on the opposite side of a football field for the Kutaisi football team.

Preliminary engineering conclusions: it will be necessary to remove some soil and wastes. There is a large reinforced concrete reservoir on the site, which is full of water. The concrete walls of that reservoir are damaged and the water is leaking from there and getting into the ground. There are water pools on the territory which means that the ground is soaked with the water from that reservoir. In the case of construction the water must be pumped out and the reservoir destroyed. 1.5 km of asphalt road will be required in order to have proper access to the site.

Prior to construction geological and topographical surveys must be carried out.

Conclusion: taking into consideration the above mentioned, the site is not cost-effective for housing construction due to high additional expenses.

APPENDIX 5 – FIGURES 1-7 – BATUMI, POTI, AND KUTAISI SITE MAPS AND SITE PHOTOGRAPHS

FIGURE 1 – Georgia Location Map – Possible New IDP Building Sites -Batumi, Poti and Kutaisi Cities

FIGURE 2: Possible New IDP Building Sites – Batumi Site Location Map

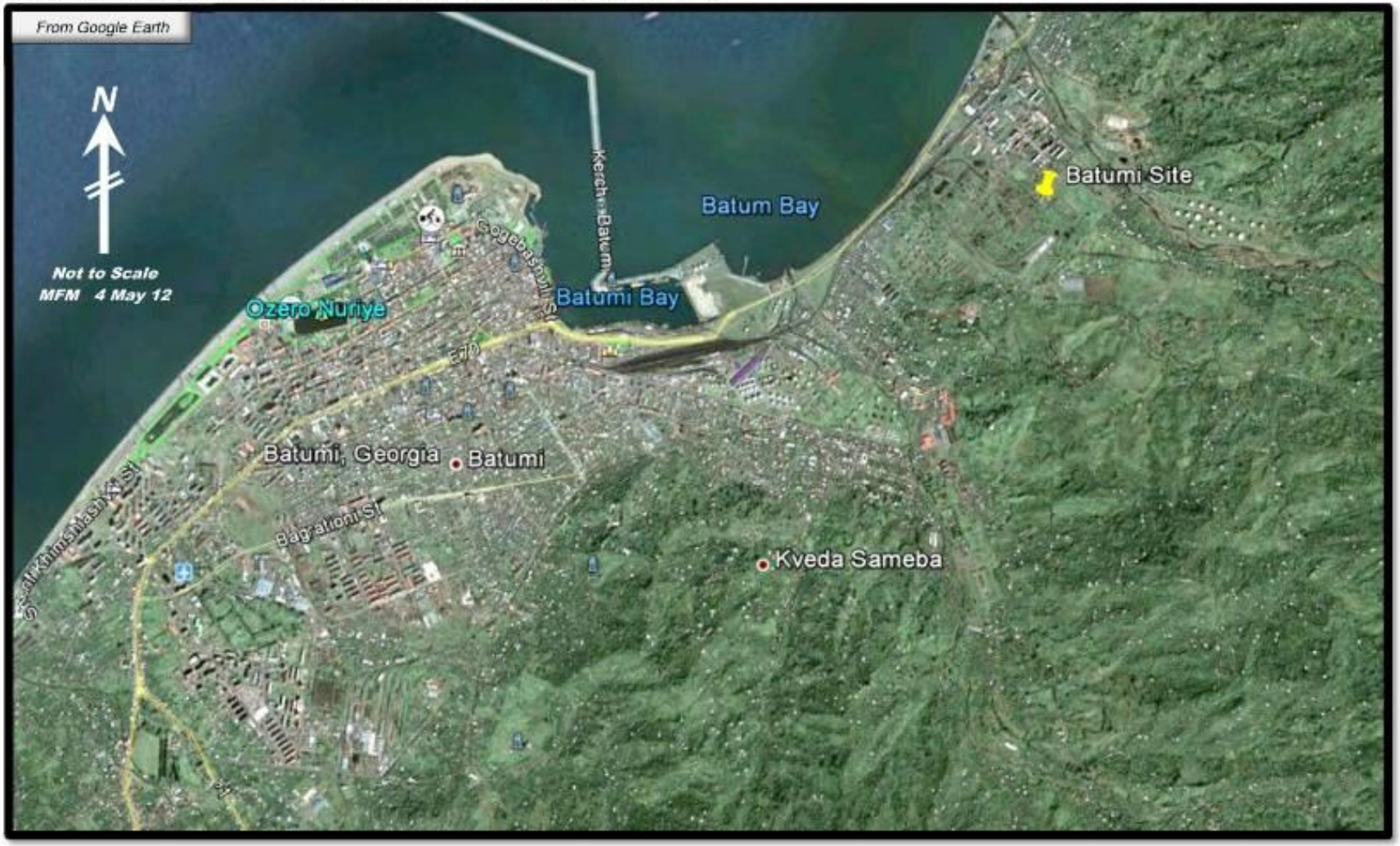


FIGURE 3: Possible New IDP Building Sites – Poti Site Location Map

FIGURE 4: Possible New IDP Building Sites – Kutaisi Site Location Map

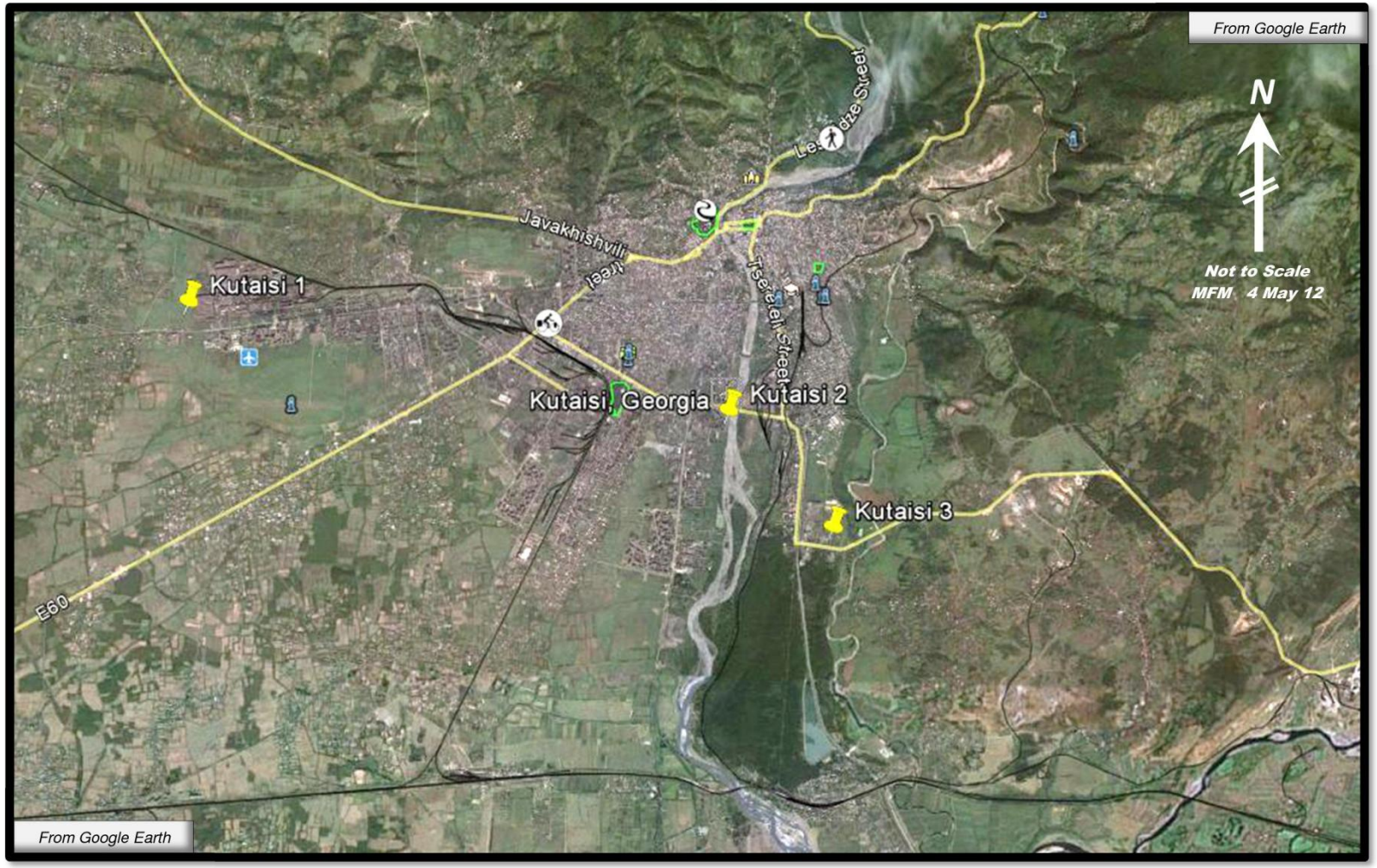
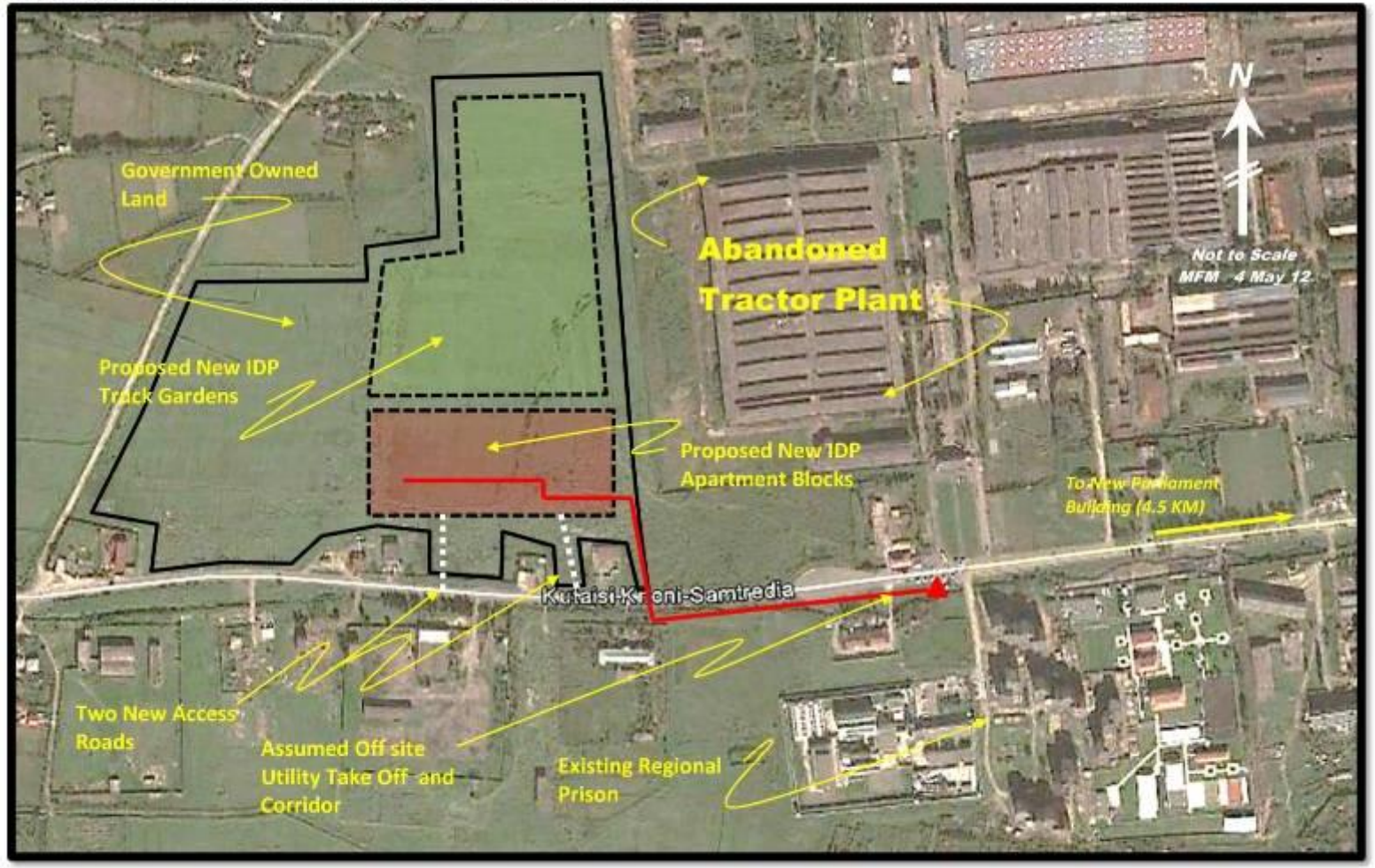


FIGURE 5: Possible New IDP Building Sites – Batumi Site Map

FIGURE 7: Possible New IDP Building Sites – Kutaisi #1 Site Map



Photographs – Proposed New IDP Block Land

Photograph 1: **Batumi New IDP Block Land**: Approximate location of land for proposed USAID funded five new IDP blocks. Photograph taken from 4th floor of existing IDP Block Apartment. Note existing abandoned Petro-chemical multi-story building ruins in background. Also note the abandoned existing process vessel. The southwest edge of the proposed lot is perhaps 30 to 50 meters past and parallel to the line of pine trees.

Photographs – Proposed New IDP Block Land

Photograph 4: **Existing Poti 32 IDP Blocks:** Looking to the Northwest, at the existing IDP Building Site. The green area in the foreground is the new government owned land for the five new IDP Blocks. This photo was taken while standing on the main Poti Highway. The site is flat, with a high water table but the ground appeared to be mostly well compacted undisturbed earth.

Photograph 5: **Existing Kutaisi Government Owned Land:** Looking to the Northwest from the Main Road. Note the abandoned Tractor Factory to the right. The green area is the land owned by the government. The site is flat, appears well drained, and made up of undisturbed earth

APPENDIX 6 – BATUMI, POTI, AND KUTAISI SITE CHARACTERISTICS MATRIX

#	Description	Batumi	Poti	Kutaisi #01
a	*b*	*c*	*d*	*e*
A.	**Proposed Physical Site and Location Characteristics**			
1	**Land Ownership**	MRA reports that the land is state owned. Prior to any development planning, evidence of ownership should be provided from the GOG to Tt. There may be some utility (Gas. Electric) easements or ROWs on this property	MRA reports that the land is state owned. Prior to any development planning, evidence of ownership should be provided from the GOG to Tt. Some private residential land might exist on the periphery of the property; perhaps two to four private lots (say each 1/8 ha). MRA reports that if they interfere with many proposed development MRA can use GOG power of condemnation to acquire the property and demolish the existing houses. All the houses did have residents in them at the time of our visit	MRA reports that the land is state owned. Prior to any development planning, evidence of ownership should be provided from the GOG to Tt. Some private land might exist on the periphery of the property; perhaps three private commercial lots (say each 1/4 ha). These buildings looked like shops with living quarters attached
2	**Current Land Use**	The land in currently open but was the site of an old petro-chemical plant that was first constructed in the 1930s and expanded over time until its destruction in the early 1990s. The land has a significant amount of demolished concrete and other material remaining on-site that is the remains of the plant	This is large open lot. It is unknown what this land was used for previously. There are some building remains on-site including some old concrete flooring. Perhaps four to six residential lots dot the site on the edges near the main road. The Mayor of Poti says this land has been set aside for the construction of future IDP Housing since 2009	This is a large open lot that appears to be older agricultural land. At this time some animals are grazing on the land but it is unused
3	**Area**	The total land available is reported by MRA to be 47,035 m^2. The total land needed for a five building development site needed is approximately 2.0 to 4.0 ha	The total land available is reported by MRA to be 30,110 m^2. The total land needed for a five building development site needed is approximately 2.0 to 4.0 ha	The total land available is reported by MRA to be 31,559 m^2. The total land needed for a five building development site needed is approximately 2.0 to 4.0 ha
4	**Location**	The site is approximately 4.4 km northeast of Batumi City Center, on Abkhazia street, southwest of the new IDP housing settlement constructed in 2011. The site is also directly south of the older (constructed in the 1930s)	The site is in the southern suburbs of Poti, immediately west of National Highway E 70 and the Sokhumi and Gagra Streets. It is also adjacent and northeast of the new IDP housing settlement constructed in 2011	Extreme western suburb of Kutaisi, just outside City limits, on the main Kutaisi-Khoni-Samtredia Secondary Road, in the last section of Autokarkhana district, adjacent to and immediately west of the

		Tamar Subdivision		large abandoned Automobile/Truck Factory
5	**Neighbors**	to the north, new IDP settlement, 22 buildings with approx. 3,000 to 3,500 residents , other directions have no neighbors as this large site was once a petro-chemical plant	To the west, a new IDP settlement of 32 buildings with approx. 4,500 residents. To the north there are two residences on the edge of the property and to the east, there is National Highway E 70	There is a very large abandoned and ex-state owned truck and automobile plant to the east of this site. Residential and commercial properties are located on the edges of this land. The Kutaisi Regional Prison stands across the main street to the southeast of the site. This appears to be a medium size, medium to maximum security installation
6	**Shopping**	There are food and convenience shopping facilities within 500 meters of the site	There are several nearby food and convenience stores nearby	There are no shopping facilities within one km of the site
7	**Schools**	Some schools approximately two km from the site	Some schools approximately 200 meters from the site	Some schools approximately one km from the site
8	**Police and Fire**	There is a police station within 150 meters of the site. No Fire Service was seen nearby and MRA staff with us did not know where the nearest Fire Station was	The Mayor of Poti told us that a new Police Station was planned to be built within the area to serve the existing new IDP residences within the next eight months	There is a police station within one km north of the site. No Fire Service was seen nearby but MRA staff told us the area was served by the City Fire Brigade located approximately two km north of the site
9	**Hospital / Clinic**	There is a clinic one km north of the site	There is a clinic 500 meters north of the site	There is a hospital approximately 2.5 km east of the site
10	**Public Transport**	Private and public busses run out to the new existing IDP residences	Private and public busses run out to the new existing IDP residences	Private and public busses run out to the prison are now. MRA staff with us said that service would be easily extended to this new site if requested
11	**Solid Waste Removal**	Batumi City wheeled disposal bins were seen in the new IDP residences. It is obvious that these services could easily be extended to the new site	Poti City wheeled disposal bins were seen in the new IDP residences. The Mayor of Poti promised that these services would be extended to the new site	Solid waste services are extended to the Kutaisi city Line that is 500 meters east of the site. MRA officials said these services could easily and be extended and would be to any new site
12	**Parking**	Parking is not an issue at the site today. Parking for any new IDP building complex can be designed for the new complex as there is an abundance of space available	Parking is not an issue at the site today. Parking for any new IDP building complex can be designed for the new complex as there is an abundance of space available	Parking is not an issue at the site today. Parking for any new IDP building complex can be designed for the new complex as there is an abundance of space available

13	**Zoning / Master Plan Issues**	Batumi City is growing fast. City staff report there is a Master Plan but there is currently no development plan for this land.	The Mayor of Poti told us that the plan was for this land and other land to the south to be used for new IDP Housing since 2009	The Mar staff with us and the City staff we met with said there was a Kutaisi Master Development Plan and that the city development was planned in this direction. This is the same main street where the new Parliament Building is located, approximately 4.5 km to the east
B.	**Socio Economic Issues**			
1	**IDP Profile**	In Batumi in total there are 3,894 IDPs. 153 IDPs live in existing Batumi Collective Centers, the rest live in private sector housing. Most of them are from different regions of Abkhazia	In Poti in total there are 10,252 IDPs. 1,846 IDP live in existing Collective Centers, the rest live in private sector provided housing. Most of them are from different regions of Abkhazia	In Kutaisi there are 13, 321 IDPS. There are 4,431 IDPs living in existing Collective Centers and 2, 798 living in private sector provided housing. All of them are in need of better shelter. Most of them are from different regions of Abkhazia
2	**Current Housing Situation**	In Batumi 3,000 to 3,500 IDPs are living in new housing settlements and in the private sector. A few are still in Collective Centers but very few. Any families still reside in private sector provided housing	In Poti approximately 4,500 IDPs are living in new housing settlements with a few still living in Collective Centers and in the remaining number are living in private sector provided housing	In Kutaisi IDPs are living in Collective Centers, private sector provided housing and in some newly rehabilitated buildings. Some of the Collective Centers are in poor condition and are referred to as Collapsing Collective Centers now. Six of these existing CCs were rejected by USAID and Tt for rehabilitation as the buildings were deemed structurally unsound
3	**Employment Prospect**	According to the MRA and GOG representatives met on site, 20-30% of the existing IDP population in Batumi is employed. They also reported that there are plans to open a new sewing factory in the near future close to the existing IDP new building settlement and a railway "dead head" with different warehouse storage facilities and other mechanical facilities as well. They said IDPs as	The Mayor and the MRA reps reported that only 150 IDPs were currently confirmed with full time employment at this time and that the unemployment rate is about 90%. The Mayor also reported that in the near future he expects some industrial jobs to open a s there have been discussions with private sector investors to open a new metallurgical factory, two steel mills and a logistical center. Both IDPs and local population will be	It is reported that the employment rate in Kutaisi may be somewhat higher than in Poti and Batumi and in the other cities as well although it was not clear what they were doing. One MRA staff member noted that there may be enough land on this new site to allow existing IDPs who moved to the new buildings to perhaps begin small vegetable gardens and to sell

		well as local population will have more opportunity to find employment here. Jobs in the port were also available seasonally and temporary construction jobs were also increasing in Batumi	eligible for employment in these new factories	produce grown there
4	**Reintegration Potential**	Good based on economic opportunities	Limited based on economic and cluster effect of grouping/segregating IDPs into one location	Excellent based on economic and educational opportunities
C.	**Engineering / Infrastructure issues**			
1	**Access**	There is easy access to this site from the main primary road and secondary road leading to the existing new IDP housing blocks. There are no traffic issues of note. No new traffic signalization, turn lanes, or much road construction will be required for this new development except for entrances to the road.	There is easy access to this site from the main primary road (E 70)and the existing access road to the new IDP housing blocks. There are no traffic issues of note. No new traffic signalization will be required for this new development however turn lanes might benefit traffic flow on the main road along with some new signage at the new entrances	There is easy access to this site from the main primary road (Kutaisi-Khoni-Samtredia Secondary Road) and the existing access road to the new IDP housing blocks. There are no traffic issues of note. No new traffic signalization will be required for this new development however turn lanes might benefit traffic flow on the main road along with some new signage at the new entrances
2	**Water**	The 200 mm PVC water main feeding the new existing IDP housing block is approximately 800 meters to the south east. Municipal officials state that this line can be tapped for this new development. Water service is provided 24 hours per day.	A 300 mm PVC water main supplies water to the existing IDP housing units. Water is currently supplied for four hours a day but after rehabilitation of the water system, expected later this year, it will increase up to seven hours a day. It is obvious that there is source adequacy issues in Poti but the Mayor said that we could tap into this water line that is less than 400 meters from the proposed site	The 200 mm PVC water main feeding the existing prison is approximately 700 meters to the east on the main road. Municipal officials state that this line can be tapped for this new development. Water service is provided 24 hours per day.
3	**Wastewater**	Batumi Municipal officials report that a connection to the existing city collection system is available to the southwest of the proposed site where the existing IDP blocks drain. It is estimated that this connection can be done with a 500 meter gravity	The MDF (EU funding) is building for the City of Poti, a new WWTP west of the existing IDP blocks to treat WW currently discharged raw to a creek that drains to the ocean. The Mayor and other Poti city officials said that the proposed development would simply tie into the new treatment	Kutaisi Municipal officials report that a connection to the existing collection system is available on the main road or at the old abandoned automobile factory. This is perhaps 500 meters distant. It is assumed both of these connections can be made with a gravity line. The

		line. The City has a functioning WWTP	plant interceptor that will be passing just south of the proposed new development. It is assumed that this connection can be made with a gravity line	City has functioning WWTP
4	**Electricity**	The U/G electrical transmission line that feeds the existing new 22 block IDP development is adequate to serve the new five block development. The proposed tie in location is approximately 800 meters to the south east	The U/G electrical transmission line that feeds the existing new 32 block IDP development is adequate to serve the new five block development. The proposed tie in location is approximately 400 meters to the north	The O/H electrical transmission line that serves the prison can be tapped for use by the proposed development. This O/H line is 700 meters to the east of the proposed site
5	**Gas**	The existing IDP blocks are fed by a gas transmission line 800 meters to the southeast. This proposed development can also tap into the same transmission line	The existing IDP blocks are fed by a gas transmission line 100 meters to the east. This proposed development can also tap into the same transmission line	A tap can be made on the main road near the prison approximately 700 meters to the east
6	**Telephone**	No telephone land lines exist in this area	No telephone land lines exist in this area	No telephone land lines exist in this area
7	**CATV**	CATV does not exist in this area of Batumi	CATV does not exist in this area of Poti	CATV does not exist in this area of Kutaisi
D.	**Environmental & Health Issues**			
1	**Air**	There is large natural gas storage terminal near the site. IDP residents report there is highly noxious odor on site that occurs periodically when gas is being off loaded from the rail cars that supply the tanks facility. It is unknown what health effects tis may be causing but it requires study	No issues other than existing traffic emissions from the nearby primary road	No issues other than existing traffic emissions from the nearby primary road
2	**Water**	The top of the upper aquifer is about 1.0 to 1.5 meters BGS (below ground surface). This means the site requires close attention to foundation design. The presence of the abandoned petro-chemical plant also means that the water table requires attention in terms of testing to ensure that there is no hazardous compounds present	The top of the upper aquifer is about 1.0 to 1.5 meters BGS (below ground surface). This means the site requires close attention to foundation testing.	It is unknown the depth to ground water on this site, however considering the proximity of the large abandoned vehicle plant, water testing is needed to ensure no industrial (metals, plating chemicals, hydrocarbon) pollution is present prior to any consideration for site development here
3	**Soils**	This is the site of an older and abandoned petro-	There is miscellaneous minor garbage and construction	This site has been fenced and appears to used for

		chemical plant. There is a large amount old building debris remaining on site (perhaps greater than 50,000 M^3 including pieces of RC larger than estimated five tons) that has not been properly disposed of. Further these appears to also be some liquid and solid industrial waste remaining on site. The site requires a serious hazardous material study and soil testing protocol before it is considered for the building of any residential housing.	wastes on or about 30-35 % of the surface of site, including small pieces of reinforced concrete, plastic and polyethylene. At one of the edges of the territory there are two ruined buildings with reinforced concrete and foundation remains. It would appear that the existing soils under these small piles of debris are more or less undisturbed earth	grazing. As such the site appears to be undisturbed earth and in good condition
4	**Flora and Fauna**	In the middle of the land available for development, there are 34 mature fir trees and some other trees. There are also three for four pools of standing water that have small lizards, mammals and birdlife. If this site is considered for further development, additional studies will be needed of the site flora and fauna	This site is devoid of trees and animal life	This site is covered in low grass and wild flowers. The land is fenced and there is some grazing on-going now
5	**Archeological**	Visual inspection and discussions with Municipal officials indicate that there are no archeological remains on or near the site. It will be necessary however to conduct a more formal investigation of the site if it is chosen to consider this site further	Visual inspection and discussions with Municipal officials indicate that there are no archeological remains on or near the site. It will be necessary however to conduct a more formal investigation of the site if it is chosen to consider this site further	Visual inspection and discussions with Municipal officials indicate that there are no archeological remains on or near the site. It will be necessary however to conduct a more formal investigation of the site if it is chosen to consider this site further

APPENDIX 7 – FIGURES 8 AND 9 – KUTAISI SITE PLANS

FIGURE 8: Kutaisi #1 Site – Illustrative IDP Apartment Block Layout and Surroundings *(not to scale, 20 May 2012)*

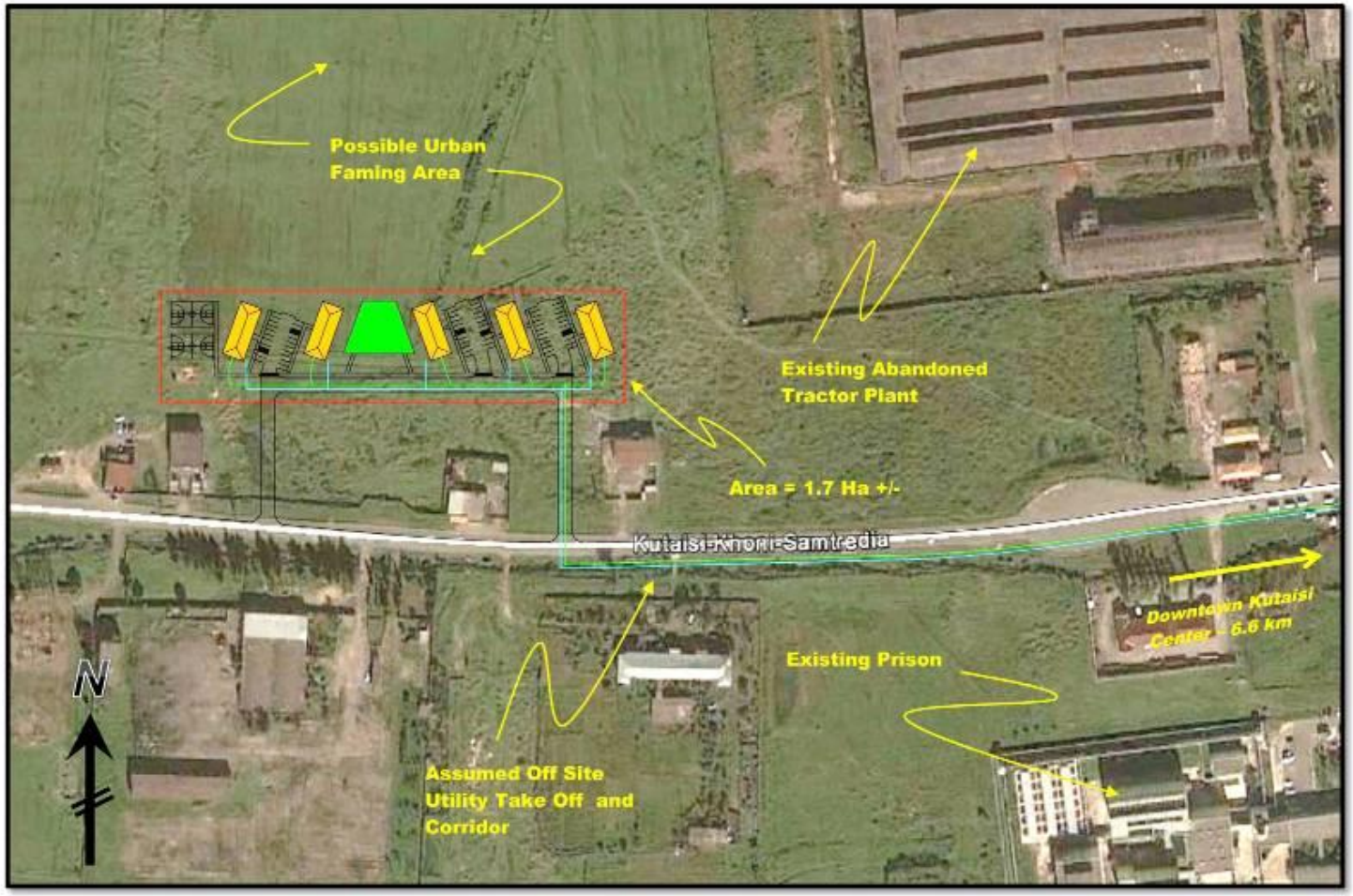
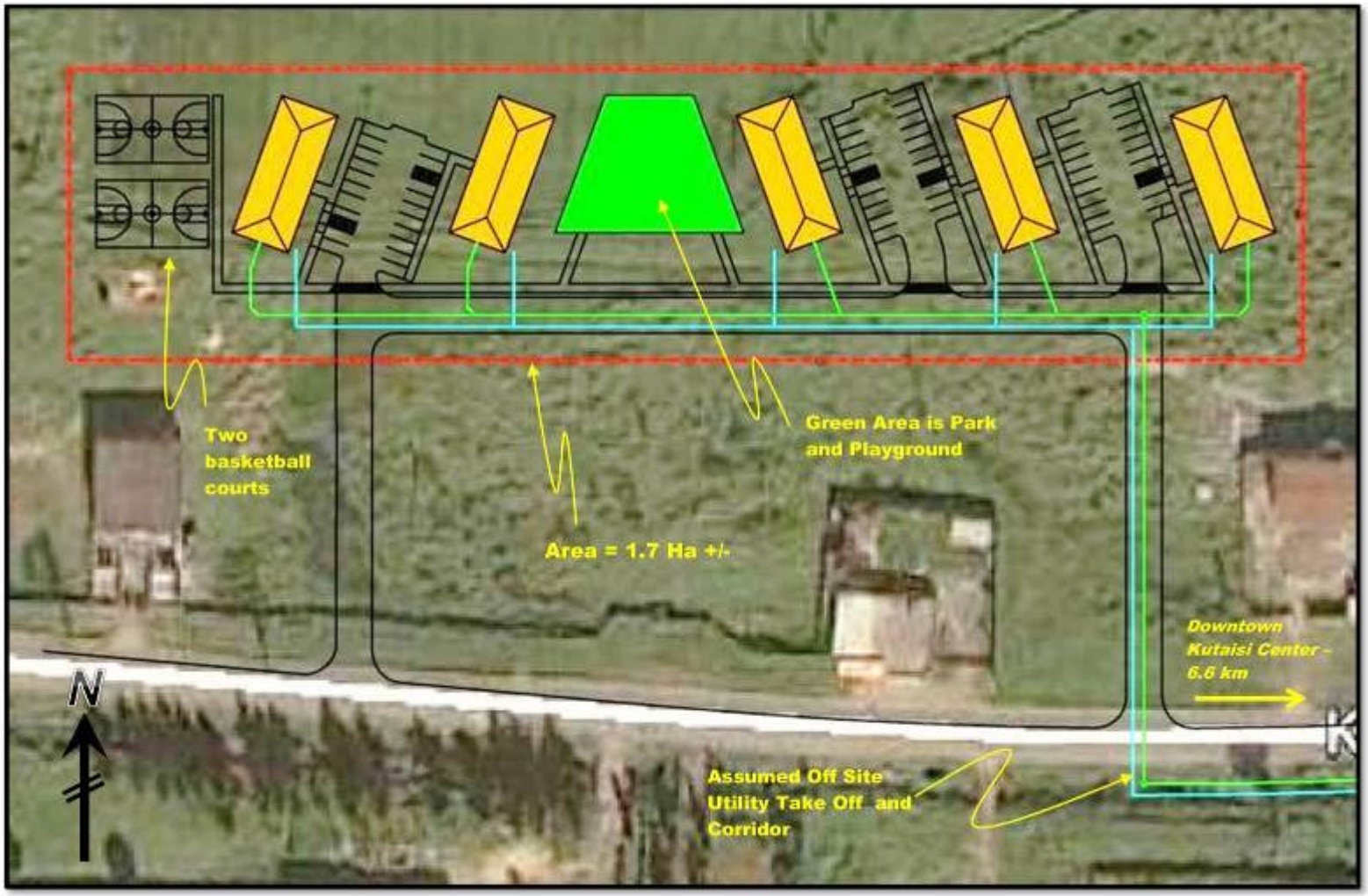


FIGURE 9: Kutaisi #1 Site – Illustrative IDP Apartment Block Layout *(not to scale, 20 May 2012)*



APPENDIX 8 – BATUMI, POTI AND KUTAISI OFF- AND ON-SITE COST ESTIMATES

Preliminary Cost Estimate Multi Story IDP Apartment Buildings

Notes

1 This is a preliminary cost estimate for the on- and off-site infrastructure planning, design, procurement and construction required to serve a generic five apartment building block development. Each building has 32 apartments (5 buildings - 160 apartments

2 CM - cubic meter, SQM - square meter, LM - linear meter,

#	ITEM DESCRIPTION	UNIT	UNIT COST (GEL)	Batumi		Poti		Kutaisi	
				QUANT-ITY	COST (GEL)	QUANT-ITY	COST (GEL)	QUANT-ITY	COST (GEL)
a	*b*	*c*	*e*	*d*	*f*	*d*	*f*	*d*	*f*
4	1,000 mm precast concrete manhole (Avg. 1,500mm depth), ladder, cover, benched, installed complete	Each	1,200.0	6	7,200	6	7,200	6	7,200
	Subtotal On-Site Wastewater Collection (I-B)				**17,118**		**17,118**		**17,118**
C	**ELECTRIC**								
1	Excavation, trench (Avg. 500mm depth), compact, backfill, dress	LM	2.1	480	1,008	480	1,008	480	1,008
2	380V high voltage cable armored 4 X 70mm copper wires, 5 - building drops, installed complete	LM	50.0	480	24,000	480	24,000	480	24,000
3	Main NEPA IV electrical distribution panel with breakers installed complete	Each	250.0	5	1,250	5	1,250	5	1,250
	Subtotal On-Site Electric (I-C)				**26,258**		**26,258**		**26,258**
D	**GAS**								
1	Excavation, trench (Avg. 300mm depth), compact, backfill, dress	LM	1.8	480	864	480	864	480	864
2	110mm welded steel pipe, tested, installed complete	LM	20.0	90	1,800	90	1,800	90	1,800
3	50mm welded steel pipe, tested, installed complete	LM	15.0	390	5,850	390	5,850	390	5,850
4	Distribution panel, all site valving, regulators, installed complete	Each	5,000.0	1	5,000	1	5,000	1	5,000
	Subtotal On-Site Gas (I-D)				**13,514**		**13,514**		**13,514**
E	**GRADING AND DRAINAGE**								
1	Remove and dispose of old construction debris	CM	4.0	18,000	72,000	2,000	8,000	-	-
2	Add general select fill material, spread and compact, finish grade complete	CM	3.5	30,000	105,000	20,000	70,000	20,000	70,000
3	Graded drainage swale, 3M wide, 1M depth, with 100mm gravel lining on bottom, installed complete	LM	80.0	150	12,000	150	12,000	150	12,000
	Subtotal On-Site Grading and Drainage (I-E)				**189,000**		**90,000**		**82,000**
F	**ROADS AND SIDEWALKS**								

Preliminary Cost Estimate Multi Story IDP Apartment Buildings

Notes

1 This is a preliminary cost estimate for the on- and off-site infrastructure planning, design, procurement and construction required to serve a generic five apartment building block development. Each building has 32 apartments (5 buildings - 160 apartments

2 CM - cubic meter, SQM - square meter, LM - linear meter,

#	ITEM DESCRIPTION	UNIT	UNIT COST (GEL)	Batumi		Poti		Kutaisi	
				QUANT-ITY	COST (GEL)	QUANT-ITY	COST (GEL)	QUANT-ITY	COST (GEL)
a	*b*	*c*	*e*	*d*	*f*	*d*	*f*	*d*	*f*
1	Asphalt paving for 8.0M (2-lanes) roadway, 150mm thickness, subgrade prep, 100mm placed and compacted aggregate base course, precast concrete curbing and gutter, installed complete	SQM	55.0	1,800	99,000	1,800	99,000	1,800	99,000
2	Asphalt paving for 100 parking spaces and access roadway, 150mm thickness, subgrade prep, 100mm placed and compacted aggregate base course, precast concrete curbing and gutter, installed complete	SQM	55.0	1,200	66,000	1,200	66,000	1,200	66,000
3	Signage	Lump Sum	2,000.0	1	2,000	1	2,000	1	2,000
4	Cast in place PCC sidewalk, 100m thickness, installed complete	SQM	70.0	450	31,500	450	31,500	450	31,500
5	Lighting standard, 4.0M height, 150mm diam. steel pipe, with conductor, and base, installed complete	Each	1,100.0	27	29,700	27	29,700	27	29,700
	Subtotal On-Site Roads and Sidewalks (I-F)				**228,200**		**228,200**		**228,200**
G	**Landscaping & Public Infrastructure**								
1	Trees (48)	Lump Sum	5,000.0	1	5,000	1	5,000	1	5,000
2	Shrubbery	Lump Sum	3,000.0	1	3,000	1	3,000	1	3,000
3	Xeriscaping (plastic sheeting, 100mm gravel) installed complete	SQM	3.0	1,100	3,300	1,100	3,300	1,100	3,300
4	Park and Playground, asphalt walkway, sand play area, 20 benches, six children's amusement rides, installed complete	Lump Sum	25,000.0	1	25,000	1	25,000	1	25,000
5	Basketball courts, three, six posts, backboards, baskets, asphalt paving, painting, installed complete	Lump Sum	15,000.0	1	15,000	1	15,000	1	15,000
	Subtotal On-Site Landscaping (I-G)				**51,300**		**51,300**		**51,300**
	SUBTOTAL I - CONSTRUCTION / ON-SITE INFRASTRUCTURE				**554,997**		**455,997**		**447,997**
II	**CONSTRUCTION / OFF-SITE INFRASTRUCTURE**								
A	**WATER SUPPLY**								

Preliminary Cost Estimate Multi Story IDP Apartment Buildings

Notes

1 This is a preliminary cost estimate for the on- and off-site infrastructure planning, design, procurement and construction required to serve a generic five apartment building block development. Each building has 32 apartments (5 buildings - 160 apartments

2 CM - cubic meter, SQM - square meter, LM - linear meter,

#	ITEM DESCRIPTION	UNIT	UNIT COST (GEL)	Batumi		Poti		Kutaisi	
				QUANT-ITY	COST (GEL)	QUANT-ITY	COST (GEL)	QUANT-ITY	COST (GEL)
a	*b*	*c*	*e*	*d*	*f*	*d*	*f*	*d*	*f*
1	Excavation, trench (700mm depth), compact, backfill, dress	LM	2.1	1,000	2,100	200	420	480	1,008
2	Push-on joint pipe (AWWA C900-07 or equal), D-200mm, disinfected and tested, installed complete	LM	25.0	1,000	25,000	200	5,000	480	12,000
3	All fittings, mass concrete blocking, installed complete	Each	195.0	20	3,900	10	1,950	10	1,950
4	3.0mm air release/vacuum relief valve assembly, manhole, cover, installed complete	Each	165.0	3	495	1	165	2	330
5	200mm gate valve, valve box, cover, stem installed complete	Each	229.0	2	458	1	229	2	458
6	200 mm fire hydrant assembly, 2M spur pipe, gate valve, check valve, riser, installed complete	Each	355.0	2	710	1	355	1	355
	Subtotal Off-Site Water Supply (II-A)				**32,663**		**8,119**		**16,101**
B	**WASTEWATER COLLECTION**								
1	Excavation, trench (Avg. 1,500mm depth), compact, backfill, dress	LM	2.1	500	1,050	200	420	700	1,470
2	PVC sewer pipe (ASTM D2729 or equal), D-200 mm, pressure tested, backfilled, installed complete	LM	21.0	500	10,500	200	4,200	700	14,700
3	1,000 mm precast concrete manhole (Avg. 1,500mm depth), ladder, cover, benched, installed complete	Each	1,200.0	5	6,000	2	2,400	7	8,400
	Subtotal Off-Site Wastewater Collection (II-B)				**17,550**		**7,020**		**24,570**
C	**ELECTRIC**								
1	Excavation, trench (Avg. 500mm depth), compact, backfill, dress	LM	2.1	800	1,680	100	210	700	1,470
2	380V high voltage cable armored 4 X 70mm copper wires, 5 - building drops, installed complete	LM	50.0	800	40,000	100	5,000	700	35,000
	Subtotal Off-Site Electric (II-C)				**41,680**		**5,210**		**36,470**
D	**GAS**								

Preliminary Cost Estimate Multi Story IDP Apartment Buildings

Notes

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#	ITEM DESCRIPTION	UNIT	UNIT COST (GEL)	Batumi		Poti		Kutaisi	
				QUANT-ITY	COST (GEL)	QUANT-ITY	COST (GEL)	QUANT-ITY	COST (GEL)
a	*b*	*c*	*e*	*d*	*f*	*d*	*f*	*d*	*f*
1	Excavation, trench (Avg. 300mm depth), compact, backfill, dress	LM	1.8	800	1,440	100	180	750	1,350
2	110mm welded steel pipe, tested, installed complete	LM	20.0	800	16,000	100	2,000	750	15,000
	Subtotal Off-Site Gas (II-D)				**17,440**		**2,180**		**16,350**
E	**ROADS, SIDEWALKS, LANDSCAPING**								
1	Asphalt paving for 8.0M (2-lanes) roadway and two intersections, 150mm thickness, subgrade prep, 100mm placed and compacted aggregate base course, striping, precast concrete curbing and gutter, installed complete	SQM	55.0	300	16,500	300	16,500	300	16,500
2	Signage	Lump Sum	500.0	1	500	1	500	1	500
3	Landscaping	Lump Sum	1,000.0	1	1,000	1	1,000	1	1,000
	Subtotal Off-Site Roads and Sidewalks (II-E)				**18,000**		**18,000**		**18,000**
	SUBTOTAL II - CONSTRUCTION / OFF-SITE INFRASTRUCTURE				**127,333**		**40,529**		**111,491**
III	**CONSTRUCTION / OPERATIONS AND MANAGEMENT**								
1	Mobilization (percent of const.)	7.0%			47,763		34,757		39,164
2	Demobilization / Clean Up (percent of const.)	4.0%			27,293		19,861		22,380
3	Clean Up, Lay Down Yard & Site Security	3.0%			20,470		14,896		16,785
4	Construction staking	2.0%			13,647		9,931		11,190
5	Construction testing	1.5%			10,235		7,448		8,392
6	Permitting and licensing	Lump Sum			1,200		1,200		1,200
7	OH and Profit (percent of const.)	40.0%			272,932		198,610		223,795
	SUBTOTAL III - CONSTRUCTION / OPERATIONS AND MANAGEMENT				**393,540**		**286,702**		**322,906**
	SUBTOTAL - CONSTRUCTION				**1,075,870**		**783,228**		**882,394**
IV	**A&E SERVICES**								
1	Engineering (Design, Drawings, Spec.'s)	7.0%			75,311		54,826		61,768
2	Surveying	1.5%			16,138		11,748		13,236
3	Geotechnical testing and report	Lump Sum			10,000		10,000		10,000

Preliminary Cost Estimate Multi Story IDP Apartment Buildings

Notes

1 This is a preliminary cost estimate for the on- and off-site infrastructure planning, design, procurement and construction required to serve a generic five apartment building block development. Each building has 32 apartments (5 buildings - 160 apartments

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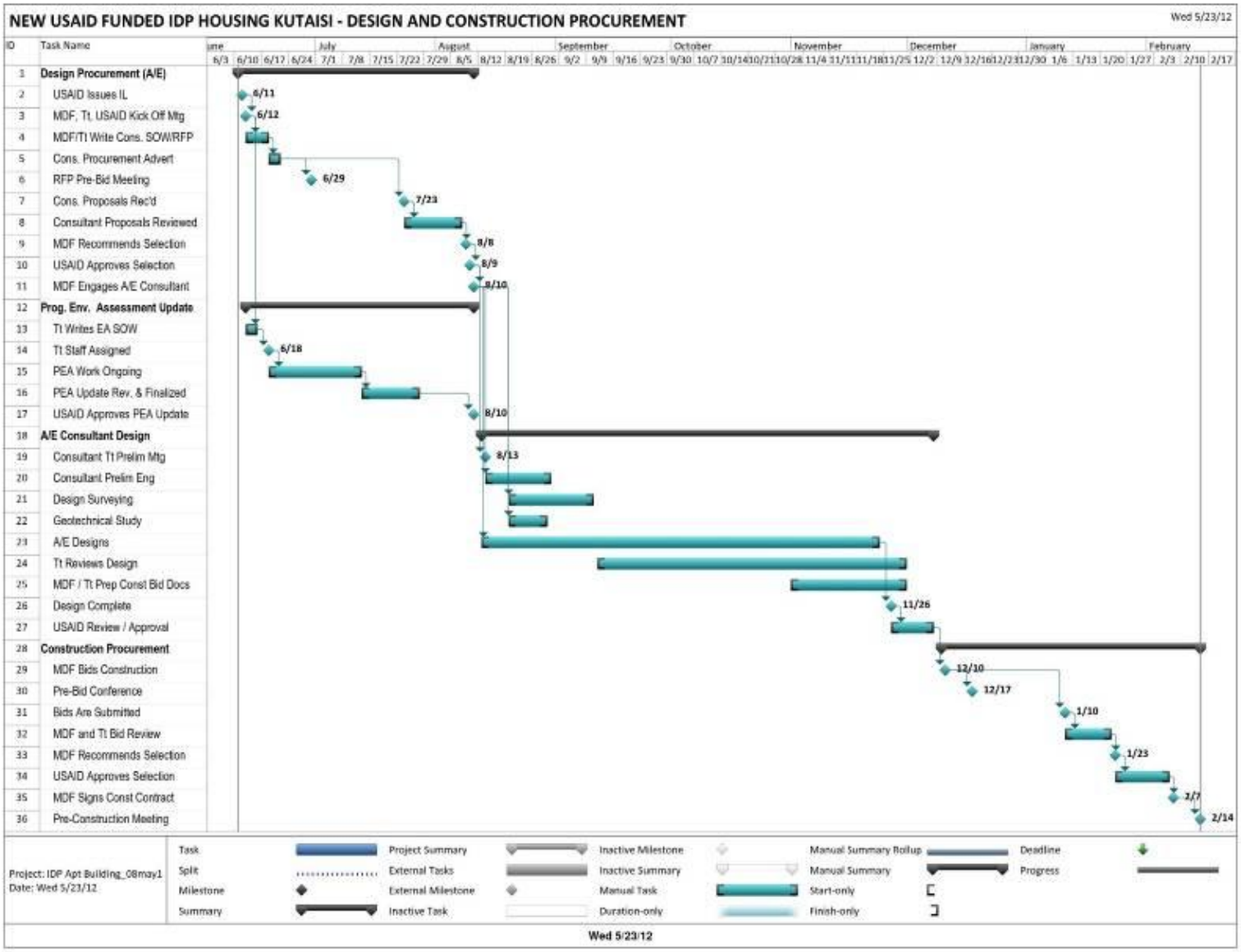
#	ITEM DESCRIPTION	UNIT	UNIT COST (GEL)	Batumi		Poti		Kutaisi	
				QUANT-ITY	COST (GEL)	QUANT-ITY	COST (GEL)	QUANT-ITY	COST (GEL)
a	*b*	*c*	*e*	*d*	*f*	*d*	*f*	*d*	*f*
4	Bidding and construction assistance	Lump Sum			15,000		15,000		15,000
5	Construction inspection	4.0%			43,035		31,329		35,296
6	Planning	Lump Sum			10,000		10,000		10,000
7	Landscape architecture	Lump Sum			10,000		10,000		10,000
	SUBTOTAL IV - A&E SERVICES				**179,484**		**88,078**		**93,532**
	GRAND TOTAL IDP APARTMENT CONSTRUCTION (GEL)				**1,255,353**		**871,306**		**975,925**
	GRAND TOTAL IDP APARTMENT CONSTRUCTION (USD)				**760,820**		**528,064**		**591,470**
	@	*1.65*	*$/GEL*						

APPENDIX 9 – PROPOSED IMPLEMENTATION SCHEDULE AND NOTES


NEW USAID FUNDED IDP HOUSING KUTAISI - DESIGN AND CONSTRUCTION PROCUREMENT
Wed 5/23/12
ID
Task Name
1 Design Procurement (A/E)
2 USAID Issues IL
3 MDF, TI, USAID Kick Off Mtg
4 MDF/TI Write Cons. SOW/RFP
5 Cons. Procurement Advert
6 RFP Pre-Bid Meeting
7 Cons. Proposals Rec'd
8 Consultant Proposals Reviewed
9 MDF Recommends Selection
10 USAID Approves Selection
11 MDF Engages A/E Consultant
12 Prog. Env. Assessment Update
13 TI Writes EA SOW
14 TI Staff Assigned
15 PEA Work Ongoing
16 PEA Update Rev. & Finalized
17 USAID Approves PEA Update
18 A/E Consultant Design
19 Consultant TI Prelim Mtg
20 Consultant Prelim Eng
21 Design Surveying
22 Geotechnical Study
23 A/E Designs
24 TI Reviews Design
25 MDF / TI Prep Const Bid Docs
26 Design Complete
27 USAID Review / Approval
28 Construction Procurement
29 MDF Bids Construction
30 Pre-Bid Conference
31 Bids Are Submitted
32 MDF and TI Bid Review
33 MDF Recommends Selection
34 USAID Approves Selection
35 MDF Signs Const Contract
36 Pre-Construction Meeting
June
July
August
September
October
November
December
January
February
6/11
6/12
6/29
7/23
8/8
8/9
8/10
6/18
8/10
8/13
11/26
12/10
12/17
1/10
1/23
2/7
2/14
Project: IDP Apt Building_08may1
Date: Wed 5/23/12
Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Deadline
Progress
Wed 5/23/12

New IDP Buildings Schedule Companion Notes

Task #	Task Name	Who	Task Description
a	*b*	*c*	*d*
1	**Design Procurement (A/E)**		
2	USAID Issues Implementation Letter	Brad, George	USAID issues direction to MDF adding new building component and changing overall project budget
3	MDF, Tt, USAID Kick Off Mtg	Jeff, Ilya, Kartios, Zurab, Brad, George, Vasil, Timur	This meeting covers the work to be done to get the project started and completed to the beginning of actual construction. Assignments are given and questions answered
4	MDF and Tt Write A/E Consultant SOW and RFP	Ilya, Timur, Joe, Kartios	This SOW / RFP is for traditional architecture, engineering design, survey, geotechnical, and construction management services of the five buildings and the on-site and off-site infrastructure. Note that we have to redesign the existing buildings
5	MDF A/E Consultant Procurement Advertisement	Kartios, Zurab	Public advertising of the A/E RFP
6	RFP Pre-Bid Meeting	Kartios, Zurab, Jeff, Ilya, Timur, Vasil	This is an important meeting where the potential bidders are told what MDF, Tt, and USAID want from them if they are selected
7	MDF A/E Consultant Proposals Received	Kartios, Zurab	Open Proposals, Read off Bids
8	MDF A/E Consultant Proposals Reviewed	Kartios, Zurab	MDF carries our Proposal and Bid Evaluation
9	MDF Recommends A/E Selection	Kartios, Zurab	MDF formally recommends USAID approve the selected proposer/bidder
10	USAID Approves A/E Selection	Brad, George	USAID reviews the MDF recommendation internally and finally approves MDF's selection
11	MDF Engages A/E Consultant		MDF signs A/E design contract
12	**Programmatic Env. Assessment (PEA) Update**		
13	Tt Writes PEA SOW	Jeff, Ilya	The Buildings PEA needs to be updated. Write a SOW to do the Update
14	Tt Staff Assigned	Mamuka L	Engage Mamkua L to do the update
15	PEA Update Work Ongoing	Mamuka L	Carry out the update work
16	PEA Update Reviewed and Finalized	Jeff, Ilya	Tt, MDF, and USAID review and finalize the Update
17	USAID Approves PEA Update	Brad, George	USAID approves the Update
18	**A/E Consultant Design**		
19	Consultant Tt Preliminary Meeting	Consultant, Jeff, Ilya, Timur, Joe, Kartios	Discuss architectural and engineering work needed to produce contract documents - drawings, specifications, and bid docs for the five buildings and the on- and off-site infrastructure
20	Consultant Prelim Eng	Consultant	Travel to Kutaisi and gather Municipal data on utilities. Work with city government to ensure all City requirements will be included in design. Start surveyor off on design survey. Start geotech engineer off on geotechnical study
21	Design Surveying	Consultant	Survey all land and center lines for buildings and utilities. Ensure land ownership, plats, deeds, recorded etc.

New IDP Buildings Schedule Companion Notes

Task #	Task Name	Who	Task Description
a	*b*	*c*	*d*
22	Geotechnical Study	Consultant	Consultant geotechnical subcontractor takes soil samples and examines subsurface profiles on site of proposed building /roads, tests soils in the lab, and reports on soil characteristics and recommends foundation and road design parameters
23	A/E Carries Out Planning and Design	Consultant	A/E designs buildings and infrastructure. Works with city of Kutaisi
24	Tt Reviews Design	Timur, Joe	Tt Home Office review consultant designs to ensure IBC compliance
25	MDF / Tt Prep Const Bid Docs	Consultant	MDF, Tt, and the consultant prepare the construction bid documents
26	Design Complete	Consultant	Consultant completes drawings, specifications, bid documents, engineer's cost estimate
27	USAID Review / Approval	Brad, George	USAID reviews and approves project for construction procurement
28	**Construction Procurement**		
29	MDF Bids Construction	Kartios, Zurab	MDF releases advertisement for RFPs for the construction
30	Pre-Bid Conference	Kartios, Zurab, Jeff, Ilya, Timur, Vasil	MDF, Tt, and USAID hold a Pre-Bid conference to alert potential bidders of what is wanted an needed and highlighted project construction requirements such as quality, safety and environmental compliance
31	Proposals Are Submitted	Consultant	Bid Opening Day. MDF identifies lowest apparent bidder
32	MDF and Tt Bid Review	Kartios, Zurab, Jeff, Ilya, Timur, Vasil	Construction Bid Proposal Evaluation committee meets and evaluates proposals and bids
33	MDF Recommends Selection	Kartios, Zurab	MDF Evaluation Committee selects a Construction Contractor and completes a memorandum of selection and submits it to USAID for review and approval
34	USAID Approves Selection	Brad, George	USAID reviews MDF Bid Evaluation memorandum and recommendation and approves it
35	MDF Signs Const Contract	Kartios, Zurab	MDF signs Construction Contract
36	Pre-Construction Meeting	Kartios, Zurab, Jeff, Ilya, Timur, Vasil	This is an important meeting where the selected contractor is briefed specially about on-site inspection, quality and safety requirements and other expected outcomes during and at the completion of construction

APPENDIX 10 – IBC COMPLINCE REVIEW

IQC Drawing Review
Republic of Georgia, IDP Housing Type B-1
Drawings Dated 01-03-09

Comment #	Reviewer	Reference	Comment	Importance
ARCHITECTURAL COMMENTS				
			Reviewer assumptions: Drawings were reviewed against IBC 2012 and all section and table references are from this Code. Per Section 310, Occupancy: R-2 (apartment house), Per table 503, Construction Type: IIA (allows 4 stories + 2044m²)	
			Reviewer Disclaimer: Energy Efficiency was not part of this review but would recommend that the IECC be used as a guide to increase the thermal performance of this building.	
A-1	Kristen Bouffard	A-2 thru A-5	Per Section 420, walls separating dwelling units are to be fire partitions per Section 708. Per Section 420, floors are to be designed as horizontal assemblies per Section 711.	
A-2	Kristen Bouffard	A-2 thru A-5	Automatic sprinkler system is required per Sections 903.2.8, 903.3.2	This is a serious Life Safety Issue
A-3	Kristen Bouffard	A-2 thru A-5	Fire Alarms and Smoke Alarms are required per Section 907	
A-4	Kristen Bouffard	A-2 thru A-5	Per Table 601 construction type IIA requires the following ratings: 1 hour structural frame, 1 hour bearing walls, 1 hour floor and 1 hour roof. Compliance with this is not stated on the drawings but it should be. If this can be IIB construction all these ratings go to 0.	
A-5	Kristen Bouffard	A-2 thru A-5	Balcony projections must comply with Table 705.2. This could not be determined due to lack of site plan.	
A-6	Kristen Bouffard	A-2 thru A-5	Compliance with maximum area of exterior openings allowed per Table 705.8 could not be determined due to lack of site plan.	
A-7	Kristen Bouffard	A-2 thru A-5	Per Section 708, confirm the walls separating the dwelling units are 1 hour fire-rated fire partitions including the supporting structure (this should be stated on the drawings).	
A-8	Kristen Bouffard	A-2 thru A-5	Per section 711 the floors separating the dwelling units need to be 1 hour fire-rated horizontal assemblies. (Note: this would not be required if this building was type IIB construction, however this building exceeds the allowable area) Note: Per Section 506, area increases are possible but with out a site plan this could not be determined.	

Comment #	Reviewer	Reference	Comment	Importance
ARCHITECTURAL COMMENTS				
A-9	Kristen Bouffard	A-2 thru A-5	Per Section 713, The stairs and mechanical shafts need to comply with the provisions of shaft enclosures. The shafts need a 2 hour rating because they are connecting 4 stories or more. Shaft enclosures are to be constructed as fire barriers per section 707.	
A-10	Kristen Bouffard	A-20	Per 716.5.3, the doors out of the dwelling units to the corridor are fire doors that need to be 20 minute fire-rated and have self closing hardware.	Life Safety issue
A-11	Kristen Bouffard	A-2 thru A-5	Per Section 906, 1 fire extinguisher with a minimum rating of 1-A:10-B:C needs to be provided per dwelling unit.	Life Safety issue
A-12	Kristen Bouffard		Per Section 2.9.1, A manual fire alarm system is required for this building.	Life Safety issue
A-13	Kristen Bouffard		Per Section 907.2.11.2, Smoke alarms are required near the bedrooms in this building.	Life Safety issue
A-14	Kristen Bouffard		Per Table 907.5.2.3.3, 4 units in this building need to be equipped with visible alarms.	Life Safety issue
A-15	Kristen Bouffard		Per 1004 Table 1004.1.2, occupant load should be calculated and stated on the drawings. Residential is 18.58m² per person.	Life Safety issue
A-16	Kristen Bouffard	A-2	Per Section 1008.1.2, the stair door must swing in the direction of egress travel.	Life Safety issue
A-17	Kristen Bouffard	A-2 thru A-5	Per Section 1009.3, Stairways shall be enclosed in a 2 hour fire-rated shaft enclosure.	Life Safety issue
A-18	Kristen Bouffard	A-14	Per Section 1009.15, provide handrails on both side of the stairs.	Life Safety issue
A-19	Kristen Bouffard	A-14, A-15	Per Section 1013, guards are required at the stairs with not openings greater than 102mm. The guards that are designed would need closer spacing of members to be code compliant.	Life Safety issue
A-20	Kristen Bouffard	A-16	Per Section 1013, The guards that are designed would need closer spacing at the bottom members to be code compliant.	Life Safety issue
A-21	Kristen Bouffard	A-8	Confirm 90cm dimension to the finished sill height, per Section 1013.8 91.4cm is the minimum allowed.	
A-22	Kristen Bouffard	A-2 thru A-5	Per Section 1018, Corridor are to be fire-rated fire partitions. Per Table 1018.1 for R occupancy greater than 10 occupants "not sprinklered" is not allowed and 30 min rating would be allowed with sprinklers.	This is a serious Life Safety Issue
A-23	Kristen Bouffard	A-2 thru A-5	Per Table 1021.2(1), Dwelling units are not permitted to only have access to 1 exit, you have 2 sets of 5 units per floor that each only have access to 1 exit.	This is a serious Life Safety Issue

Comment #	Reviewer	Reference	Comment	Importance
ARCHITECTURAL COMMENTS				
A-24	Kristen Bouffard	A-2 thru A-5	Per 1022.9 Stairway identification signs are required.	
A-25	Kristen Bouffard	A-2 thru A-5	Per Section 1026.6, Stair needs to separated for the interior of the building.	
A-26	Kristen Bouffard	A-10 thru A-12	Per Section 1029, provide emergency escape and rescue openings for sleeping rooms on the 3rd story and below. Follow sizes as outlined in Section 1029.2. The current window types will not comply.	This is a serious Life Safety Issue
A-27	Kristen Bouffard	A-2 thru A-5	Per Section 1103, this building should have accessible units. Per Table 1107.6.1.1, there are 32 units in this building so 2 units need to be accessible.	
A-28	Kristen Bouffard	A-22 thru A-24	The WC in the accessible units will need to be redesigned per ICC A117.1 to meet code.	
A-29	Kristen Bouffard		Per Section 1209.1 Provide at least 1 crawl space opening not less than 457mm x 610mm. The Drawing set should have a crawl space plan to show compliance with this item.	
A-30	Kristen Bouffard		Include an attic level plan to show attic access location and wall locations for clarity.	
A-31	Kristen Bouffard	A-6	Per Section 1503.6, provide a cricket or saddle on the ridge side of the ventilation shafts along column lines 1 and 7.	
A-32	Kristen Bouffard	A-16	Considering the slab at the roof level the 1 hour fire-rated roof, the hatch allowing attic access needs to be a 1 hour fire-rated hatch.	
A-33	Kristen Bouffard	A-25	A roof framing plan needs to be shown and designed to meet the Code recognized local seismic, wind and snow loads.	
A-34	Kristen Bouffard	A-25	Per Section 603, roof framing members need to be Fire-retardant-treated wood to be permitted in Type II construction.	

IQC Drawing Review
Republic of Georgia, IDP Housing Type B-1
Drawings Dated 01-03-09

Comment #	Reviewer	Reference	Comment	Importance
STRUCTURAL COMMENTS				
S-1	FPH	Building Design	Calculations were not provided for the subject building. Comments regarding specific items were not possible without calculations to compare to the plans. A set of calculations limited to a printout using a proprietary structural analysis software was provided in a combination of languages, including Georgian and Russian, for a different building. This allowed brief review of the procedure assumed to be used for Type B building design, but, not on specific design items which could not be commented on. Additional calculations showing design of specific items, such as slabs, beams, columns, footings, etc., would provide a significantly more accurate determination of compliance with IBC.	
S-2	FPH	Building Design	A set of specifications was also provided for another project. Based on these specifications, concrete and reinforcement design strengths are much higher than those usually considered by IBC. Higher strength materials could result in higher stiffness and, subsequently, higher loads in the lateral load resisting system. This may or may not result in higher cost of materials. Inspection of placement and material testing may be more costly to assure the levels used in design are provided in the field, particularly for cast-in-place concrete.	
S-3	FPH	IBC, ASCE 07-05, SNiP 11-7-81	Building design calculations reference a Russian Code (SNiP 11-7-81). Based on a cursory review of the code from partial translations found on the internet, this code is not as rigorous and detailed as IBC regarding seismic design of concrete structures. Review of available translation information did not allow comparison of the Russian Code requirements for lateral loading with IBC requirements.	
S-4	FPH	LIRA Software	Review of LIRA website notes the software can perform dynamic analysis, analyze wind loads and earthquake loads, and design reinforced concrete and steel elements according to codes from the USA. Building design was not designed in accordance with IBC seismic requirements.	This is potentially a serious Life Safety Issue
S-5	FPH	SNiP 11-7-81	Calculations use "A=0.09" when Russian Code (SNiP 11-7-81) requires Ground Category III structures to use "A=0.4"	

Comment #	Reviewer	Reference	Comment	Importance
STRUCTURAL COMMENTS				
S-6	FPH	Structural Dwg. 32 ACI 530	This page details Concrete Masonry Unit (CMU) walls. Walls are not designed to be part of the seismic resisting system, and are therefore classified as "nonparticipating elements," which require isolation joints designed to accommodate story drift. Isolation joints are provided at the top of interior wall (JOINT DETAIL), but, none are provided at tops of exterior wall or on vertical joints at the columns (section b-b). Any seismic event will cause overstress of wall panels and increased rigidity of the building system. Building will not act as designed laterally. Potential wall failure and collapse would create a hazardous condition.	This is a serious Life Safety Issue
S-7	FPH	Structural Dwg. 32 ACI 530	External wall CMU details include horizontal joint reinforcing extending 1500 mm from each column at 600 mm intervals vertically in the wall. Interior walls appear to have no reinforcement. UBC/ACI provisions require minimum reinforcement in all masonry walls for out of plane forces. Reinforcement provided for exterior wall does not appear to meet those requirements. Interior 100 mm walls are too thin for adequate reinforcement for out of plane forces. Exterior walls may be overstressed during seismic event in out of plane direction. Interior walls will be overstressed during seismic events. Potential wall failure and collapse would create a hazardous condition.	This is a serious Life Safety Issue
S-8	FPH	Structural Dwg. 23 & 23 / ACI 318M	According to IBC/ACI all nonprestressed bars in columns shall be enclosed by lateral ties at least ϕ10. Plans show ϕ8 ties. Smaller ties could potentially fail in higher level seismic events.	Life Safety
S-9	FPH	Structural Dwg. 29 & 30 / ACI 318M	According to IBC/ACI bars in all flexural members, including beams, shall be enclosed by lateral ties at least ϕ10. Plans show ϕ8 ties. Smaller ties could potentially fail in higher level seismic events.	Life Safety

IQC Drawing Review
Republic of Georgia, IDP Housing Type B-1
Drawings Dated 01-03-09

Comment #	Reviewer	Reference	Comment	Importance
MECHANICAL COMMENTS				
1	JLM	All Mechanical Drawings	Demonstrate that IMC ventilation code rates are being provided to each unit. Provide calculations on drawing or in a Design Analysis.	Required code item
2	JLM	All Mechanical Drawings	How is ventilation or make-up air provided to each unit? Through ventilation fans or operable windows? Indicate on plans or in Design Analysis.	Required code item
3	JLM	All Mechanical Drawings	Show and indicated how combustion air is provided to each gas heater. Provide typical detail.	Required for unit performance and is required by code.
4	JLM	All Mechanical Drawings	Show and indicated how combustion flue gases are being vented from each gas heater. Provide typical detail.	Required for unit performance and is required by code.
5	JLM	Specifications	No Mechanical (HVAC) specifications were provided.	Should be required
6	JLM	Specifications	Specification for gas piping is shown to be schedule 40 PVC piping, this is of great concern. In the International Fuel Gas Code, the only approved plastic piping is "Polyethylene" and it must conform to the 2009 ASTM D 2513 standard and must be marked on the piping "Gas" and "ASTM D 2513"	High Importance, this must be fixed as this could cause bodily injury or death and destruction of the building.

IQC Drawing Review
Republic of Georgia, IDP Housing Type B-1
Drawings Dated 01-03-09

Comment #	Reviewer	Reference	Comment	Importance
PLUMBING COMMENTS				
1	GPD	Specifications	Need to be more specific on what materials will be accepted for the various plumbing piping systems. Consider adding a table indicating the acceptable piping materials for each system type.	Important
2	GPD	Specifications	Include testing requirements for natural gas piping system.	Very important
3	GPD	Specifications	Include material and performance requirements for plumbing fixtures and equipment.	Very important
4	GPD	Drawings	The WC Elevation drawings give a good indication on where the fixtures and equipment will be located in the bathrooms. The plans need further development to indicate domestic water and sanitary sewer routing outside of the toilet rooms. Limiting the amount on non-plumbing related information shown on the plumbing plans would help make the drawings read easier.	Very important
5	GPD	Drawings	Need to indicate routing of natural gas piping on plans.	Very important
6	GPD	Drawings	Include sanitary waste and vent isometrics for each riser type.	Important
7	GPD	Drawings	Include a riser diagram for natural gas piping system, showing regulators, connected gas load capacities and pressure requirements.	Important

IQC Drawing Review
Republic of Georgia, IDP Housing Type B-1
Drawings Dated 01-03-09

Comment #	Reviewer	Reference	Comment	Importance
ELECTRICAL COMMENTS				
1	JAS	Specifications	Minimum wire size should be #14 AWG or 2.5 sq mm, or as appropriate for the circuit overcurrent device rating.	Important
2	JAS	Specifications	All conductors shall be protected from physical damage as required by National Electrical Code (NEC) 300.4.	Important
3	JAS	Specifications	Expand paragraph on grounding of switchgears and panelboards.	Very Important
4	JAS	Specifications	Add paragraph about grounding electrode systems to include ground rods (minimum of 3Mx20mm), building structural steel, if any, concrete encased reinforcing steel in footings and any internal metallic piping systems.	Critical
5	JAS	Specifications	Include paragraph stating that the neutral and ground (earth) bus bars shall be bonded in the building service entrance.	Critical
6	JAS	Drawings	On E-02 and E-03 the feeder from the Meter Cabinet (Switchgear) to each apartment panel appears to be inadequate. Each apartment is fed by a 63A circuit and the cable must be rated at least 63A. It appears to be 10 sq mm but should be at least 25 sq mm per NEC and Table 4D2A of BS7671, or equivalent IEC table.	Very Important
7	JAS	Drawings	Add grounding (earthing) details on future designs. Grounding shall be in accordance with NEC Article 250.	Critical
8	JAS	Drawings	Typical for all apartments. Provide ground fault protection (GFCI) or RCD protection for sockets located in the Bathrooms and near the Kitchen sink, as required by NEC and BS7671.	Critical
9	JAS	Drawings	Consider adding Arc Fault protection for sockets located in Bedrooms or sleeping areas.	Important
10	JAS	Drawings	Show a circuit and wiring for the electric water heater.	Important
11	JAS	Drawings	Add a panel schedule showing typical loads for each apartment.	Moderate
12	JAS	BOQ	The cable sizes shown in the BOQ are not adequate for the circuit ratings shown on the panelboards.	Very Important
13	JAS	BOQ	The circuit breaker sizes shown for the panelboards in the BOQ do not match what is shown on the drawings.	Very Important

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